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ALCOHOL AND HYGIENE;

AN ELEMENTARY

LESSON BOOK FOR SCHOOLS.

BY

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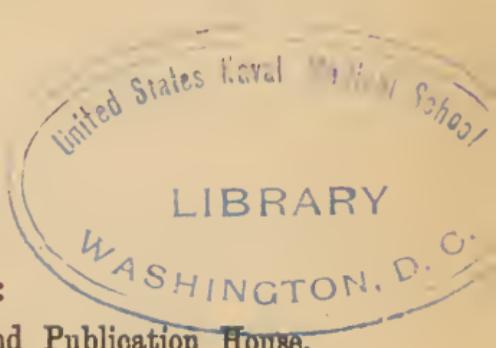
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P R E F A C E.

WE offer you a study of the nature and effects of alcohol for the school. Is the thought new to you? If you are a parent, you may look upon the innocent forms of your children with their frank, loving ways and reply, "My children are safe." If you are a teacher, as you look over the fresh, young faces before you, you can hardly pick out one that you think likely to become a drunkard. If you are a school officer, you will probably see greater danger and more need of this teaching; though it is difficult for any one to foresee for any child the terrible degradation which makes so great a contrast between the purity of childhood and the besotted condition of the inebriate.

There is, however, a moral certainty that a large proportion of the children under your care, if they get no special teaching in this line, will be greatly injured by alcoholic liquors and in many cases their prospects will be ruined and their lives lost. All the 500,000 drunkards in this country,

all the 60,000 that die from this cause every year, were children once—fair and pure like those under your care. The ravages of intemperance are far more devastating than those of small-pox ; yet you would not rest a day if your children were not guarded against the latter. Why then should you longer neglect to provide against the greater evil ? What better patrimony could a father bestow upon his children than to make them reasonably safe from so terrible a scourge ?

But, beyond this, the wise parent, teacher, or guardian is preparing the child for a career of usefulness. The future legislators, executives, professional men, and skilled workmen of the country are now in the school-room. You have a right to expect that your children will occupy some of the positions of honor and influence which await the coming generation. To do so successfully they must know how to handle this problem. It is so enwrapped with every interest —public and private, political, financial, moral, and social—that they can not escape it if they would. If you would have them meet it wisely, let its first principles be well understood. If you think others are fanatical, or that they have zeal without knowledge, then give your children knowledge, sober common sense, and the facts of science. We have in these pages tried most sin-

cerely to make no statement unsustained by ample proof. Investigate for yourselves. Judge wisely. It is our belief that the problem can not be fully solved until such knowledge becomes general.

To many who read these lines the subject is not new. We need hardly say to you that we bring this unpretending work to help the younger classes who can not yet aspire to Richardson's "Lesson Book." We do not claim the authority of original investigation, but perhaps we shall not therefore be denied the privilege of collecting the facts of science from authorities of undoubted excellence and making them plain to the young. The work is very far from perfect. Its preparation has been carried on amid other cares and duties, and hurried by the appeals of those who are waiting almost impatiently for its appearance. There must be a beginning; but, while we thus try to do the work of to-day, we look eagerly and hopefully for those who are to do the broader and better work of to-morrow.

J. C.

LESSON I.

WHAT IS ALCOHOL?

1. WE often hear of alcoholic drinks and the harm that is done by them. We propose in this book to learn something of what alcohol is and what it really does to those who take such drinks.

2. Alcohol is a colorless, intoxicating liquid produced by fermentation.^a It looks so much like water that it might be readily mistaken for it at first sight. But it is so much unlike it in its real nature that you can easily make some striking experiments.

3. Water will put out fire. Alcohol will feed a fire. It will also burn by itself. Suppose then (experiment 1) you have two clear glass vials filled, one with alcohol and the other with water. Now, ask some one standing at a little distance to point out which is alcohol and which is water.

Questions.—1. What do we often hear? What do we propose to learn?

2. What is alcohol? What does it look like? Is it like water in its real nature?

3 and 4. Mention one thing in which alcohol and water are very much unlike. Describe experiment 1.

4. If he can not do so, you may fold a slip of paper and dip one end into the alcohol and the other into the water. Touch the latter with a lighted match; it will not burn. Touch the light to the other end; it will flame up at once. Let it burn till it reaches the part wet with water, when it will go out.

5. Alcohol is made by art and man's device. You may look in vain for it in nature. You may hunt through all the forests, and examine all the springs and the caves, the rivers and the ponds, the dew of the grass, the honey of flowers, the sap of trees, the juices of fruits, and the milk of animals, and you will find no alcohol in any of them. So far as we know the Creator has never made alcohol.^a

6. Men make alcohol by letting sweet liquids stand and decay. The sweet juices of apples, grapes, berries, and other fruits are often used for this purpose. The starch of grain is also changed into sugar and washed out and decayed to make alcohol. In some countries the sweet sap of trees and plants is used for this purpose.

5. How is alcohol made? Where may you look for it in vain? Mention some of the places where you may look without being able to find it. What is said about the Creator's making alcohol?

6. How do men make alcohol? What are used for this purpose?

7. In Africa an alcoholic drink is made from the sap of the palm-tree, and in Mexico from the sap of the century-plant. In Asia they make an alcoholic drink from rice. In all countries where fruits and grains are grown, men can make some of them into alcoholic drinks, if they wish to do so.^a But they do not find any alcoholic drinks already made.

8. There is no alcohol in the fruits and grains. The sugar in the fruit-juice is changed into alcohol by fermentation. Or if grain is used, the starch is first changed into sugar, and then the sugar is changed into alcohol by fermentation.

9. This fermentation is nothing but the decay of a sweet liquid.^a You may have seen apples or pumpkins or tomatoes decay and go to pieces. Some of the juice runs away, some of the solid matter turns into gas and goes off in the air, till in some such way all is gone. When the sweet fruit-juices are pressed out and put into a dish they too decay and go to pieces.

7. What is used in Africa? Mexico? Asia? What can they make in all countries? What do they not find?

8. What is said about alcohol in the fruits and grains? What is it in the fruit-juice that is changed into alcohol? What if grain is used?

9. What is this fermentation? Describe the process of decay in apples, pumpkins, or tomatoes. What happens when the fruit-juices are pressed out and put into a dish?

10. The liquid is free to move around in itself as it could not in the decaying fruits. It has thus a chance to arrange itself in new forms and make new substances, and alcohol is one of these. It is not in the fruits and grains, be they either ripe or rotten, but it is formed by the decay of the sugar in the sweet liquid.^a

11. This decay is a filthy process. When it takes place in our stewed fruits we do not eat them, but quickly send them away from the table. All alcoholic drinks are decayed drinks, for they are made by the decay of sweet liquids, or by distilling out the alcohol which has been produced by decay.

In our next lesson we shall see how alcohol is made in cider.

10. What has the liquid a chance to do? What is thus formed? How is alcohol formed?

11. What is said of this decay? When it takes place in our stewed fruits what do we do with them? What is said of all alcoholic drinks? What shall we learn in our next lesson?

Review.—What do we propose to do in this book? Describe experiment 1. What are the reasons for saying that alcohol is not found in nature? How is alcohol made? What are some of the materials of which it is made? Describe fermentation.

LESSON II.

THE ORIGIN OF ALCOHOL.

12. CIDER is made from apples, by grinding or mashing the fruit and pressing out the juice. All apple juice contains sugar, and when this breaks up or decays it forms alcohol.^a In warm weather this decay begins very soon after it is pressed out.

13. A good experiment can be made (ex. 2), by putting some apple juice, newly expressed, into an open glass jar. Into another jar put same apples stewed with much juice, and set the two jars, side by side, in a warm place, with the thermometer at about 70 degrees.^a

14. The stewed apple-sauce soon begins to decay or "turn sour," as we say, and it is then thought unfit to eat. But if you watch both the jars, you will see that the expressed apple juice begins to decay quite as soon as the other, perhaps sooner.^a One is no more fit to drink than the other is fit to eat.

Questions.—12. How is cider made? What does all apple juice contain? How is alcohol made from it? How soon?

13. Describe experiment 2.

14. What happens to both jars? Which is the cleanest and most wholesome?

15. When each particle of sugar breaks up, a part of it is changed into alcohol and another part forms a little bubble of carbonic acid gas.^a This bubble comes to the top and helps to make the foam. If you examine the foam, you will find it made mostly of little bubbles.

16. The particle of alcohol, which is made at the same time, remains in the jar. If the apple-sauce has a more disagreeable smell than the apple juice, it is only because there is more apple in it to decay, besides the juice.

17. This is the same process that cider passes through in the barrel. The same foaming scum is there, though you can not see it quite so plainly as you can in the jar. If the barrel is nearly full, as much as two quarts of the scum will sometimes run over.

18. This is the regular process of cider-making, or of making the alcohol in cider. The usual amount of alcohol in old cider is from five to nine per cent., that is, from five to nine parts in one

15. What happens to each particle of sugar? What makes the foam?

16. What remains in the jar? What may be the cause of one smelling worse than the other?

17. How is cider made in the barrel? How much foam and scum will run over from a full barrel?

18. How much alcohol is there in old cider? How soon does it begin to decay?

hundred. It begins to decay so soon after pressing that there is no safety in drinking "new cider," unless you wish to take the alcohol with it. Whether that is safe or best, we shall see in our future lessons.

19. Cider vinegar is made by letting alcoholic cider stand and decay still more, so that each particle of alcohol is changed into acetic acid. When the vinegar is "made," the change is complete. When the vinegar is dead, then the process of decay is completed, and the apple juice has gone back to earth, air, and water.^a

20. It is often true that many of the apples used in making cider are wormy and unclean, and half rotten.^a No one of us would touch them if made into pies. They are no cleaner nor more wholesome when made into cider, though you can not so readily see their impurity.

21. A very pretty experiment (ex. 3) is to take clean, sound, and well-ripened apples, and cut and grind them yourself, with the two rows of nice white stones that nature has given you for such purposes, swallowing the juice at once, before it has a chance to ferment.

19. How is cider vinegar made? When is the process of decay complete?

20. What is true of the apples used for making cider? Are they any cleaner in the cider than they would be in pies?

21. Describe experiment 3.

22. Very many boys and girls have tried this experiment, with great satisfaction. It is believed that apples are quite suited to this use. Nature has arranged these things for us very nicely, but she has provided no barrels nor kegs to hold apple juice while it stands and decays and makes alcohol.

22. Who have tried this experiment? What has nature done for us in this line? What has she not done?

Review.—How is cider made? Describe experiment No. 2. What is proved by this experiment? What makes the alcohol? What makes the foam or scum? How much alcohol is there in old cider? How soon does it begin to form? How is cider vinegar made? In what condition are the apples used for cider? Describe experiment No. 3. What is proved by it?

LESSON III.

ALCOHOL FROM GRAPES.

23. WINE is made from grapes very much as cider is made from apples. The grapes are mashed and the juice is pressed out. Then, in making fermented wine, it stands and decays, the sugar breaking up and making alcohol.

24. We can put fresh grape juice into a jar and watch it decay (ex. 4) the same as we did the apple juice. Any one who does that will not be likely to think that wine is a very delicate drink. The scum or foam on the top is made by the carbonic acid gas and some decaying pulp ; the liquid below is mostly water, and in it is the alcohol formed by the decay.

25. Wines are often made from other fruits, such as currants, cherries, blackberries, and elderberries. These are called currant wine, cherry

Questions.—23. From what is wine made ? How is it made ? How is the alcohol made ?

24. Describe experiment 4. How is the scum or foam made ? What is the liquid below it ?

25. From what other fruits are wines made ? How are they made ? Why is sugar added ?

wine, etc. They are all made by pressing out the juice, and letting it stand and decay, till alcohol is formed. Sugar is often added so as to make more alcohol.^a

26. All our home-made wines, California wines and European wines are made in the same way. They stand and decay or ferment, the fermentation being controlled in such a way as to make as much alcohol as possible, and to preserve it in the wine after it is made.^a

27. The "unfermented wine," used sometimes for medicinal and sacramental purposes, has no alcohol in it. It is usually scalded and sealed up to preserve it from the air in very much the same way that canned fruit is sealed up and preserved. This is not kept by the regular wine-merchant or liquor-dealer. When opened and exposed to the air it spoils, or begins to decay in the same way as the fresh grape juice.

28. The proportion of alcohol in common wines varies with the sweetness of the juice. The sweetest juice that can be fermented will

26. What wines are made in this way? How is the fermentation controlled?

27. What wine has no fermentation in it? What is it used for? How is it made? When does it spoil?

28. How does the proportion of alcohol in common wines vary? What per cent. of alcohol can be made by fermentation? How much do home-made wines often contain?

not make more than seventeen per cent. alcohol, or seventeen parts in one hundred.^a Home-made wines often contain from ten to fifteen per cent.

29. The light wines of Europe sometimes do not contain more than from five to ten per cent. alcohol. If such wines as these are sent away by sea, the motion will push on the fermentation and turn the alcohol into acetic acid, making vinegar.^a

30. To prevent this result, more alcohol or brandy is added,^a so that the European wines we get in this country often contain from twenty to twenty-five per cent. alcohol.

31. Much of the so-called "wine" in the market has no grape juice in it.^a It is made of alcohol, dyestuffs, and flavorings, often deceiving the best judges.^b What is called the "best wine" is only decayed grape juice.

32. What is wanted in all these decayed wines is the alcohol, and without that no one would drink them. Dr. Richardson says that is the only

29. What do the light wines of Europe contain? If such wines are sent away by sea, what will happen?

30. What is done to prevent such a result? What per cent. of alcohol do European wines in this country usually contain? What do you mean by "per cent."?

31. What is said of much of the so-called wine in the market? How is it made? What is the "best wine"?

32. What is it that is wanted in all these decayed wines? What does Dr. Richardson say?

thing besides the water they contain that has much effect on those who drink them.^a

Grapes, like apples, are good for food. We may know that there is no alcohol in them, because they do not make those tipsy who eat them. The alcohol first makes its appearance when the sweet juice stands and decays.

What else are grapes good for? How may we know there is no alcohol in them? When does the alcohol first make its appearance?

Review.—How is wine made? Of what is it made? What is the unfermented wine? What is the proportion of alcohol in common wines? What is put into most wines? How is much of the wine in the market made up? What is specially wanted in wines? How do we know there is no alcohol in grapes? When does the alcohol first make its appearance?

LESSON IV.

ALCOHOL FROM GRAIN.

33. BEER is one of the most common of the drinks that contain alcohol. Like cider and wine, it is made by the decay of a sweet liquid. This liquid is not taken from fruits, but from grain.

34. There is much starch in grain. When the grain begins to grow, some of the starch is turned into sugar, and this feeds the young shoot until it gets roots to help its growth. If you should dig up a grain of corn as soon as it sprouts, you would find it taste quite sweet.

35. You can easily make the experiment, if you like (ex. 5). Take corn, or any kind of grain, and divide it into two parcels. Let one parcel remain as it is, and make the other quite wet, and keep it warm and wet until you can see the sprout. Now, if you taste some of each parcel,

Questions.—33. What is beer? How is it made? From what is it made?

34. Why is the starch of the grain turned into sugar? What is the taste of the sprouted grain?

35. Describe experiment 5.

you will find that which is sprouted much the sweeter.

36. A brewer is a man who makes beer. He first wets the barley and makes it sprout, to turn its starch into sugar. Then he dries it so that the sprout shall not grow and use up the sugar. He wishes to change that into alcohol. This process is called malting, and the grain is now malt.

37. The brewer next grinds and crushes the malt, pours on warm water, and mashes it in the mash-tub. This dissolves the sugar and makes the liquid sweet. This is called the "sweet wort."

38. The hulls, out of which the sugar has been washed, are called "grains." They are commonly fed to cattle and hogs. They are worth only about one-third as much as fresh grain, because the best part of them has been washed out into the water which is to make the beer.

39. The sweet wort is next boiled with hops in it. Then it is cooled and put into large vats, and

36. Describe a brewer. What grain does the brewer use? What does he first do with it? Why? Why does he dry it? What is it now called?

37. What does he do next? What does this do? What is this called?

38. What are the "grains"? What is done with them? How much are they worth? Why?

39. What is now done with the sweet wort? What is added to it? Why? How does this differ from the fermenting of the fruit juices? What is said about starting fermentation?

yeast is added to make it ferment. The fruit juices ferment of themselves, but these washings of grain need the ferment of yeast to start them. Fermentation or decay is always started more speedily if some substance is added which has already begun to decay.

40. But the process is really the same as that which took place in the cider and the wine. The particles of sugar break up and turn into alcohol and carbonic acid gas. The alcohol remains in the liquid and the gas comes to the top in bubbles, and covers the surface with a filthy yellow scum.

41. This carbonic acid gas is very poisonous to breathe.^a It sometimes stands in large quantities just above the surface of the beer, or in the vats around it, so that when a person's head is low enough to breathe it, he is liable to fall in and drown or suffocate.^b For this reason children are more likely to be poisoned by it than taller persons, and so it is best for them to keep at a distance from these brewers' vats.

42. The main object of the brewer is to make as much alcohol as possible in the beer. When

40. What is said of this process? How is the alcohol made? What becomes of it? What becomes of the gas?

41. What is said about this gas? Why is it dangerous to children?

42. What is the main object of the brewer? When made, where does he put the beer? Why does he cork it up?

he gets it to suit him, he puts the beer into bottles, or kegs, or hogsheads, and corks it up to prevent the escape of the alcohol, and calls it ready to drink.

43. Other things are sometimes put in, such as salt, arsenic, and strychnine, and sometimes, very filthy water is used in making it.^a But our special business is to inquire about what is called the best beer, or rather about the alcohol that is in it. This does more real harm than all the adulterations that are put into it.^b

44. The amount of this alcohol in beer is usually about five per cent. In lager-beer it is three or four per cent.; in some of the English ales, eight per cent., and in old ale sometimes ten or twelve per cent.^a More alcohol can easily be put in, so that those who call for it may get it as strong as they like.^b

43. What other things are put in? What is our special business? Which does more harm, the alcohol or the adulterations?

44. What is the usual amount of alcohol in beer? In lager-beer? In English ale? In old ale? How can it be made still stronger?

Review.—What is beer? How is it made? Where is this sweet liquid obtained? Describe experiment No. 5. What does it prove? How does the brewer procure sugar from grain? What is malt? What are "grains"? What is the "sweet wort"? How is it made to ferment? What is produced in this fermentation? What danger comes from the carbonic acid gas? What bad things are sometimes put into the beer? What is the worst thing in it? How much alcohol is found in the different kinds of beers?

LESSON V.

THE BREWER AND THE BAKER.

45. In making beer the brewer uses grain and yeast. Hence, some say that beer is like bread, or as good as bread. But beer is not bread, nor is it like bread. Whether or not it is as good as bread, we shall find out, when we learn what it does to those who take it.

46. The object in making bread is to preserve the nourishment in the grain and make it into a good food. The object in making beer is to destroy the nourishment, to turn the starch into alcohol, and to make an intoxicating drink.

47. The very first thing the brewer does to his grain is to make it sprout or begin to grow. The baker is very careful that his grain should not sprout nor grow. When the brewer sprouts or

Questions.—45. What does the brewer use in making beer? What do some say? What is the reply to that?

46. What is the object in making bread? What is the object in making beer?

47. What does the brewer do first? What is the baker careful to avoid? How much nourishment is destroyed in malting?

malts his grain he destroys about one-fourth or one-fifth of its nourishment.

48. After the brewer mashes his malt he floods it with water. This makes a wort which no one would think of drinking for the nourishment there is in it, even before it decays. He then sends away the hulls or grains containing the remainder of the solid food, for the animals.

49. The brewer uses yeast to ferment the wort and change the most of the nourishment that is left into alcohol. The baker uses yeast in his dough for the sake of the gas, which makes little holes or cavities in his bread,^a so that it can be more easily divided and eaten. This is what makes fermented bread light.

50. Fermenting the dough with the yeast does make a very little alcohol; but this and the gas are driven off by the heat of the oven,^a so that there is neither alcohol nor gas in the bread.^b

51. The heat stops the fermentation in the bread, so that no more alcohol nor gas is made in it. But in beer the fermentation goes on after it

48. How does the brewer make his wort? What is said of it? What does he do with the remainder of the solid food?

49. What does the brewer use yeast for? What does the baker use it for? What makes fermented bread light?

50. How much alcohol does this make? What becomes of it?

51. What does the heat do? How long does the fermentation proceed in beer?

is bottled, and the stuff is actually fermenting and decaying when it is used as a drink.

52. This fermentation in the bread destroys but a very little of the nutrition. As soon as a little gas has formed, so as to puff up the bread, the fermentation is stopped by the heat. If the bread should stand, as the beer does, and go on fermenting and decaying, it would smell so bad that you could not endure it in the house.^a On the other hand, if the beer should be so treated as to stop the fermentation early, no one would drink it, because the alcohol in it^b is what the drinkers want.

53. So, while it is true that the brewer and the baker both use grain, both grind it and both use yeast, there the likeness stops entirely. The yeast produces two very different substances, the alcohol and the carbonic acid gas.^a The brewer uses one, the baker the other.

54. The brewer turns all that he uses of the

52. What effect does this have on the bread? What stops the fermentation? Suppose it were not stopped? Suppose it should be stopped in the beer? What do drinkers want in the beer?

53. When does the likeness stop between the brewer and the baker? What two substances does the yeast produce? What is the difference in their use?

54. What does the brewer do with his grain? What does the baker do with his? What does the baker produce? What does the brewer produce?

grain into alcohol. The baker makes a very little of the gas, and uses it to make holes or cavities in his bread. So the baker saves nearly all his grain and produces a nourishing food. The brewer destroys nearly all his grain and produces an intoxicating drink.

55. There are several ways of making bread light without yeast. One is to work gas into the dough as in "aerated" bread; another is to produce gas in the bread with baking powder; still another is to stir in common air with eggs, or without them, as in sponge cake and "gems." It is quite instructive to try experiments in this line. Here is one for the girls, and for the boys, too, if they like.

56. (Ex. 6). Take very cold water, and stir in flour with a spoon, sifting it in with one hand, while you stir with the other, getting in as much air as possible. Graham flour is the best for this experiment, because you can get more air in with it. Make it just a little too thick to settle flat, and dip it into a hot French-roll pan, or into patty pans, or if you have neither, drop it in spoonfuls on a flat pan, and bake it in a very hot oven. The biscuits should be small and baked on the top first,

55. Mention some ways in which bread can be made light without yeast.

56. Describe experiment 6.

so that the heat will make a crust over them quickly and prevent the escape of the air, which will then expand in them and make them quite light.

57. These biscuits will be sweeter than if the sugar is fermented out by yeast, and, of course, a little more nourishing. The most of our cake, shortcake, crackers, and some of our bread is made without yeast or decay. Beer can not be made without yeast or decay, because the alcohol is a product of decay only.

57. What is said of these biscuits? What other things are made without yeast or decay? Why can not beer be made without it?

Review.—State the object of making beer. Describe the process. State the object of making bread. Describe the process. What two different products of the yeast are used for these different objects? Can bread be made without yeast? Describe experiment 6. What is proved by it? Why can not beer be made without yeast?

LESSON VI.

DISTILLATION OF ALCOHOL.

58. WE have been learning how alcohol is made in fermented liquors. These were in use many hundred years before men knew enough about alcohol to separate it, or even to give it a name.^a

59. At last somebody heated wine and caught the vapor and cooled it. This happened eight or nine hundred years ago.^a It has since received the name of alcohol.

60. This process is called Distillation.^a It is very simple. You can easily try it (ex. 7) by heating water till it boils, and then letting some of the steam condense or turn into water again, on your slate or any other cold surface. This condensed water is distilled water. It has been turned into steam and cooled again.

Questions.—58. What have we been learning? What is said about their being long in use?

59. How did some one find it out at last? When did this happen?

60. What is this process called? How can you try it with water?

61. Distillation can be used to separate such substances as boil at different degrees of heat. The one that turns into vapor first can be caught and cooled by itself. Alcohol begins to boil and go off in a vapor before the water is hot enough to boil.^a If the vapor is caught at that time before the water boils, you will find it quite strong of alcohol.

62. This does not make alcohol. It only separates it from the water and some of the other substances in the fermented liquor. You can try it with a pint of beer (ex. 8). Place it in a pan over a slow fire, and when it begins to simmer, spread your hands closely over it. They will soon be wet with a liquid which you will find by its peculiar smell is alcohol. After the beer has been boiled a while, you will find the alcohol all boiled out, gone off in a vapor. This vapor the distiller catches and cools, and finds it strong alcohol.

63. It is an easy matter to make a small distilling apparatus for yourself with a tea-pot, and a

61. What substances will distillation separate? Which can be caught and cooled?

62. Does this make alcohol? What does it do? How can you try it? How will you know that the liquid on your hands is alcohol? What does the distiller do with it?

63. How can you easily make a small distilling apparatus? What was done at a Temperance School in Wayne County, N. Y.?

rubber tube to connect it with a bottle on ice (ex. 9). At an examination of a Temperance School, in Wayne County, N. Y.,^a one of the scholars, a bright lad of fourteen, distilled enough alcohol from two ounces of cider to make a good blaze. (4).

64. The machinery for distillation is called a still, and the building where this sort of work is done on a large scale is called a distillery. Large copper boilers are commonly used in such stills, and the copper tube carrying off and cooling the distilled alcohol is coiled up in a cask of cold water. From the end of this tube the condensed liquid falls into a vessel by itself. This coil is called the "worm" of the still.

65. Alcohol has a strong attraction for water, so that it can not be entirely separated from it by heat. When the alcohol goes up in a vapor, it takes some of the water with it. With the greatest care, the liquid first distilled is seldom more than half alcohol. This is called the "first proof."

64. What is a still? What is a distillery? What are used in large stills? What is the worm of a still?

65. Why can not alcohol be entirely separated from water by heat? What happens when the alcoholic vapor goes off? What is the "first proof"? What proportion of alcohol has it?

66. This process makes gin, whisky, brandy, rum, and other liquors. Distilled wine makes brandy, and distilled beer makes gin. If corn, rye, or potatoes have been used to make the fermented liquor or "wash," the distilled spirit obtained is corn, rye, or potato whisky. Fermented molasses and water yield the spirit called rum.^a

67. The alcohol is all *made* by fermentation; it is only *separated* by distillation. All these distilled liquors are sometimes called "spirits," and strong alcohol is often called "spirits of wine," whatever liquor it may have been distilled from. Some other oils, and ethers come with the alcohol in very small quantities, which makes these drinks slightly different from each other.

68. If wanted yet stronger, it is put through the still again and again. When it is as strong as it can readily be made by distillation, it is called fourth-proof alcohol, and it is kept for sale

66. What does this process make? What does distilled wine make? What makes whisky? Rum?

67. How is the aleohol all made? How is it separated? What are all these distilled liquors sometimes called? What is "spirits of wine"? What makes these drinks differ from each other?

68. How can stronger alcohol be procured? What is this called? How much water has it?

by most druggists. It has yet from 10 to 25 per cent. water.^a

69. Alcohol is very useful in the arts, to dissolve gums, resins, and drugs, like shellac, camphor, and corrosive sublimate. It also burns with a clear, smokeless flame,^a so that it is much used by jewelers, for heating the jewelry on which they work. It is also used by chemists for a similar reason. If you have no alcohol lamp to try it for yourself, you can pour some into a spoon (ex. 10) and set fire to it. Then, if you hold a white plate or a silver spoon in the flame, you will not see any smoke on it.

70. Alcohol is a violent poison to all living things, both animal and vegetable. Any small creature dropped into it dies at once, as quickly as if it had been scalded. This makes it useful in destroying troublesome insects. The way in which this poison acts will be explained in our future lessons.

69. For what is it useful? What will it dissolve? How will it burn? Who use its flame? Describe experiment 10.

70. Alcohol is a poison to what? What illustration is given? What will be explained in future lessons?

Review.—Describe the process of distillation? What is its object? What substances can be separated by it? What liquors are produced by it? What is the difference between fermented and distilled liquors? State the principal parts of a still. Mention some things that alcohol is good for. Describe experiment 10. What does it prove? What is said of alcohol as a poison?

LESSON VII.

A BIT OF CHEMISTRY.

71. THE science of chemistry tells us of what substances or elements things are made, and how they may be changed into other things. These changes are made by CHEMICAL ACTION, which always changes the nature of things.^a Thus, water is made of oxygen and hydrogen, and it can be changed into these two gases by electricity, which produces the chemical action.

72. You may not be able to try that experiment, but there is one much easier which will show how things can be changed in their nature by chemical action (ex. 11). Put a piece of hard rock lime (unslaked lime) on a tin or wooden dish and pour over it water enough to keep it wet for five or ten minutes. It will then grow hot, and swell and at last crumble to a fine, dry,

Questions.—71. What does the science of chemistry tell us? What does chemical action do? Of what is water made? How may it be changed into these gases?

72. Describe experiment 11. How is this change made?

white powder. This is the lime used for white-washing and making mortar. It is very different from the rock lime. This change is made by chemical action.

73. Chemical action does a great many curious things. It makes water, oil, and potash into soap, which is a very different thing from either water, oil, or potash. Water and oil do not mingle. But putting potash with them starts a chemical action that finally unites them, and makes an entirely new substance which we call soap.

74. People do not say that there must be soap in oil, water, or potash, because we make it out of these things. And it is not true that there is alcohol in grain, fruit, or sugar because we make it out of them.^a Alcohol is made by the chemical action of fermentation, which, like other chemical action, changes the nature of things.^b

75. In this fermentation the sugar is taken to pieces and the things that made it go to make two other substances. One of these is alcohol and the other is carbonic acid gas. They are no more like sugar than soap is like oil or water.

73. What makes soap? How?

74. What do people not say about soap? What is not true about alcohol? By what chemical action is alcohol made?

75. Describe the chemical action in fermentation. What substances are produced? How much do they resemble sugar?

76. If chemical action is allowed to go on it will take the alcohol to pieces and make acetic acid, and another part of it will escape.^a Another change or two will take out the acetic acid and nothing but water and a dirty sediment will remain. These are just as much changes in the real nature of the things as the change when oil and water are made into soap.

77. There is also another kind of action which changes the nature of things. It is that action by which plants grow. Plants take in earthy substance, water, air, and gases and make them over into their own substance, roots, leaves, and fruits. This is VITAL ACTION, or the action of life. It makes our food grow and it makes our bodies grow.

78. Chemical action can do neither. It can pull things to pieces as it does in slaking lime and in fermentation, and it can put them into new shapes, like alcohol, soap, ink, and many other things, but it can not create food. Only vital action can do that.

76. What will chemical action do if allowed to go on ? What will the next change do ? What remains ?

77. What other kind of action changes the nature of things ? How do plants grow ? What is the name of this action ? What does it make grow ?

78. What can chemical action do ? What can it not do ? What is the only thing that can create food ?

79. Fermentation is only the chemical name for the decay of sweet liquids. It is the business of fermentation and some other kinds of decay to pull to pieces that which has been put together by vital action.^a This is the way provided by nature to send food and other things that we do not use back again to the earth, air, and water, from which they came.^b

80. There is still another kind of action that you know about. It is mechanical action, such as you use when you beat grains of corn to pieces, or grind them. This does not change the nature of the corn. It is starch and gluten still, only in smaller pieces.

81. If you mash fruit and squeeze out the juice, the sugar and the acids are the same as they were in the fruit, and there is no alcohol there. But let the chemical action of fermentation set to work and it destroys the sugar by breaking up its particles and changing them into alcohol.

82. The wise and learned men who are chemists

79. Of what is fermentation the chemical name? What is the business of fermentation and decay? What does nature do by this means?

80. What other action do you know about? What is said about its changing the nature of things?

81. Is there alcohol in the fresh juice of the fruit? How does fermentation produce it?

82. What do chemists tell us? What does not follow?

tell us that sugar, starch, and alcohol have the same elements, that they are each made of carbon, oxygen, and hydrogen. But it does not follow that there is alcohol in sugar and in starch, nor that there is starch in alcohol.

83. They also say that when you put these three elements together in one way they make starch, and in another way they make sugar, and in still another way they make alcohol^a—three articles that are very different in their nature and in their effects when taken. All the things we use for food, besides many that we do not use, are made up mostly of these three elements, with sometimes another, named nitrogen.

84. When these three or four elements are put together, in different ways, they may make either a wholesome food or a rank poison. When they are by themselves we never eat them. Carbon is nearly pure in coal, lampblack, plumbago, and diamond, while oxygen, hydrogen, and nitrogen are gases not visible to the naked eye.

85. We are to look after the articles made out

83. What do they tell us about making starch, sugar, and alcohol? What about their nature and effects? What other things are made by these elements? What other element is often added?

84. What is said about making foods and poisons? In what shapes are these things found when by themselves?

85. What are we to look after? What is one of them? Of what is alcohol made? Suppose we should change the proportions of one of these articles.

of these elements. Alcohol is one of them. No matter where it is, nor how many other things it has mingled with it, the alcohol itself is always the same—so much carbon, so much oxygen, and so much hydrogen. To change the proportions of one of these would change the article itself into something else. It would be alcohol no longer.

86. Chemistry is a great help to the understanding of the alcohol question. Intelligent people would often see more clearly through many things that seem perplexing in the nature and effects of alcohol if they knew more about chemical action. So we hope that all those who study “Alcohol and Hygiene” will yet take up chemistry.

86. To what is chemistry a help? If people knew more about chemical action how would it help them?

Review.—What is chemical action? Describe experiment 11. What is its object? How is soap made? How is alcohol made? What course will this chemical action run? What is vital action? How is it contrasted with chemical action? What is mechanical action? Give illustrations. What four elements mostly compose all kinds of food? What else may they make? What are they when pure, or nearly pure? Is alcohol made by any fixed rule? How does chemistry help this study?

LESSON VIII.

ALCOHOL IS GREEDY OF WATER.

87. WE learned in our lesson on distillation (65) that alcohol has a strong attraction for water, so strong that they can not be entirely separated by heat.^a If you add some other substance, which has a still stronger attraction for water, you may get the alcohol almost entirely by itself, though it is very difficult to keep it thus. It will suck moisture out of the air if left uncorked.

88. Common alcohol will draw the water out of vegetable and animal substances and keep them from decay. If you take the water out of peaches, by drying, you may preserve them from decay. Alcohol does very much the same thing: it draws the water out, but they do not shrink as they do when dried, because they are moistened

Questions.—87. What did we learn in our lesson on distillation ? How can alcohol and water be separated ?

88. Will they readily remain separated ? What will happen if you put vegetable or animal substances into aleohol ? Why do they not shrink ?

by the alcohol. Brandy peaches are made in this way.

89. You can easily try the experiment of preserving any kind of fruit in alcohol (ex. 12). Take two jars or vials of soft fruit, fill up one with water and the other with alcohol, and cork them closely. After a few days you will find that which is in water decays, as all moist foods do when not eaten or otherwise disposed of in due time, while the other keeps well, without decay.

90. You may have seen reptiles, snakes, and other creatures preserved in alcohol, in vials or bottles, in museums or in doctors' offices. It is very convenient to preserve vegetable and animal curiosities in this way for cabinets and museums.^a It has lately been found that glycerine will preserve them equally well.

91. You can also prove that alcohol extracts water (ex. 13). Take a piece of lean beef weighing eight ounces, and leave it in strong alcohol overnight. Like our own flesh, beef has much water, and alcohol takes out some of it. In the morning take it out of the alcohol, dry it with a cloth, weigh it again and you will find it has lost

89. Describe experiment 12.

90. What other experiments can you make? How are moist specimens in museums preserved?

91. Describe experiment 13.

about two ounces of water absorbed by the alcohol. It will also be reduced in size.^a

92. It does not follow that things preserved in this way are good to eat. This process makes all food harder and much more difficult of digestion, besides filling it with alcohol. We might preserve beef by salting it with corrosive sublimate, but to eat it would be certain death. The alcohol can be washed out after it reaches the stomach, and the fruit may possibly be digested, but all this makes more work for the stomach.

93. So much for the preservation of a dead substance. But alcohol can not preserve a living substance.^a It first kills, and then prevents decay. In our bodies, it tends to prevent the different changes that ought to go on—changes that are necessary to health.

94. Some people have supposed that if these changes of tissue could be prevented we could eat less and live longer. But life itself consists in these changes of tissue, expelling the worn-out matter and replacing it with new matter made

92. What does not follow? What does this process do to food? What if we should preserve beef by salting it with corrosive sublimate? What makes work for the stomach?

93. What does alcohol do to living substances? What is said of the life process? When alcohol interferes with this what happens?

94. What have some people supposed? Of what does life consist? What is said of hindering and stopping these changes?

from our food. To hinder these changes is injury, to stop them is death.^a

95. Dr. Jewett says, with much force: "It does, to a certain extent, prevent the waste of tissues. It stupefies the fellow so that he can not use his muscles or brain. Whenever you develop power you waste tissue; if you develop thought you waste brain. When a fellow is dead drunk he saves his tissues. Toads have lived in rocks one hundred years; but who wants to lead a toad's life for the sake of saving his tissues? I don't want to save my tissues. I want to go to my table every day, and have it well spread with substantial food, and incorporate the vegetable compounds and make them a part of Jewett, and then I want to use up the energy in promoting the glory of God, and advancing the good of mankind. This idea of saving tissue is all a humbug."^a

95. What does Dr. Jewett say?

Review.—What does alcohol do to water everywhere? How does alcohol preserve fruits? Describe experiment 12. What does it prove? How can you preserve the bodies of small animals? Describe experiment 13. What is its object? Is preserving food always done safely? Give illustrations. Can alcohol preserve living substances? What characteristic of life process does alcohol interfere with? What mistake have people made? Give quotation from Dr. Jewett.

LESSON IX.

ALCOHOL AND THE NERVES.

96. THE human body is seven-eighths water. That is, if it measure eight pailfuls, only one would be dry, solid matter, the other seven would be water.^a All the parts of the body are moist, and they are kept so by water. Even the bones and the teeth are not dry in a living person.

97. The blood has almost four times as much water as it has solid matter.^a And the body is so full of blood that you can not put in the point of the finest needle anywhere but that it will find some. You can try that for an experiment if you like (ex. 14). It is necessary that the blood be very fluid in order that it may flow freely through the veins.

98. The muscles must also be very moist, so

Questions.—96. What proportion of the body is water? In what parts of the body do we find it?

97. What proportion of water is in the blood? Describe experiment 14. What is proven by it?

98. Why must the muscles be moist? The eye? The mouth? Other internal organs?

that they can work easily. The eye is almost filled with a clear fluid, through which we see distinctly ; the mouth flows with saliva, so that we can chew and swallow our food readily, and the skin of all the inside organs is moist, like the mouth, so that there is no friction between them.^a

99. Alcohol when put into this moist body, absorbs some of the moisture. Strong alcohol held in the mouth a few minutes is sharp and fiery, because it begins at once to suck the moisture out of the tender skin.^a It destroys the sense of taste for a time, and, if held there long enough, it would break the skin and create sores.

100. This is exactly what it does in the stomach ; and all through the body, wherever it goes, it does mischief in this way. The organs hurry it along and pour out their fluids to wash it away and to protect themselves from harm.^a

101. But the most serious mischief is done to the nerves and the brain. The nerves are what we feel with. Like white threads or cords they go from the brain and spinal cord to all parts of the

99. How does alcohol affect this moisture ? What would strong alcohol do if held in the mouth ?

100. Where else does it do the same ? What do the organs do with it ?

101. Where is the most serious mischief done ? What do we do with the nerves ? What are they like ? How small are some of them ?

body, and back again, as telegraph wires to carry messages. Many are so small that the eye can not see them without a magnifying glass.

102. If you put your finger on a hot stove (ex. 15) the nerves report it at once to the brain. The brain sends back word to take the finger off the stove, and it is all done as quick as thought. To do it well, the nerves must be in good working order. Let us see what that means.

103. The nerve is a string of cells filled with a very moist pulp, like that of the brain,^a and the message goes through this. When this is out of order the message is not carried correctly. When the blood carries the alcohol through every part of the system, some of it comes in contact with the nerves and robs them of a part of their moisture. Thus puts them out of order.^b

104. A good authority^a says, "It instantly contracts the extremities of the nerves it touches, and deprives them of sense and motion, destroying their use." If a drunken man puts his finger on the hot stove his nerves take no message to the

102. Describe experiment 15. What is the object of this experiment? In what condition must the nerves be to do this?

103. Describe the nerves. What is necessary to their being in good working order? How does alcohol interfere with this?

104. What does a good authority say? If a drunken man puts his finger on the hot stove what follows? How did such a man burn himself?

brain, and the finger is burned. Such a man lay down by a camp fire and put his feet too near it, but he did not feel the heat, and his feet were burned to a crisp before he knew it.

105. Once a drunken man picked up a hot smoothing iron and held it on his wife's back till he had burned her severely; but he did not know how much he was hurting her, nor that he was burning his own hands at the same time.

106. A physician^a tells of a man whose limb was very badly broken while he was drunk, and he shook it about, making fun of it, and calling it a new joint, so that he had to be held still by main force to prevent his making it much worse.

107. Alcohol reaches all the nerves of the body and deranges the man in all his faculties. He does not know anything correctly; he does not judge anything correctly. We will learn more about this in the lesson on The Great Deceiver.

105. What happened in another case?

106. What fact does a physician tell?

107. What does alcohol reach? What does it do? What does the man not do? Where will we learn more about this?

Review.—State the proportion of water in the body. In the blood. Give its uses. State how alcohol affects these moist parts. Describe the nerves. State how alcohol affects them. Give facts showing how some drunken men hurt themselves because their nerves were paralyzed

LESSON X.

ALCOHOL AS A POISON.

108. We can truly call anything a poison that does so much mischief in the system as alcohol.^a We can truly call a man under its influence poisoned. And that is exactly what we do call him when we say he is intoxicated.

109. Intoxicate comes from the Latin word "Toxicum," which means poison. So a man that is intoxicated is simply poisoned.^a If a man drinks a little alcohol he is poisoned or intoxicated a little. If he drinks more he is poisoned worse.^b

110. When we say "intoxicated" we refer to that kind of poisoning that affects the brain and the nerves.^a There are several things that do this, such as opium, Indian hemp, hashish, hydrate of chloral, tobacco, chloroform, ether, etc.

Questions.—108. What can we truly say about alcohol? What about a man under its influence? What do we call him?

109. From what does the word intoxication come? What does it mean? Suppose a man drinks but a little alcohol? Suppose he drinks more?

110. What do we refer to when we say intoxicated? What other things produce intoxication?

111. The nerves of some people feel the effects of the same amount of alcohol much more quickly than others. This is true in regard to all poisons. The same amount will affect one quicker than another, but it is hardly worth the while to see which of us can be killed the most easily. It is no proof of good nerves or a perfect organism to be able to pour down a large amount of alcoholic poison without showing it.

112. The experiment is foolhardy, and those who make it are sure to suffer from it. Many a person has killed himself outright, and others but a little more slowly, in attempts to show off. Two men in Rochdale, Eng.,^a made a bet as to who could drink the most rum, and each drank about thirty cents' worth. One fell dead in a few moments, and the other became insensible. The idea was about as silly as if they had tried to see who could best endure a mad dog's bite.

113. Alcohol is called a poison by those learned men who have studied and experimented the most with it, and who, therefore, know the most about

111. How do its effects vary? What is hardly worth the while? What is no proof of good nerves?

112. What is said of the experiment and of those who make it? What has many a person done? Tell what happened at Rochdale, Eng.

113. By whom is alcohol called a poison? Where have they put their ideas? What do people say of these books?

it. A large number of men who understand chemistry and physiology and medicine, have called it a poison.^a They have put their ideas about it into books which we may read, and which people call good authority.

114. There are certain large books called Dispensatories which tell about the nature of drugs of all kinds. These are studied by doctors and druggists, and they are sometimes kept in public libraries. If you should turn to the article "Alcohol" in most of these books you would be sure to find it called a poison.^a

115. "The American Dispensatory" says about alcohol, "Undiluted, it is a powerful irritant poison, rapidly causing intoxication, and in large quantities, death." "The United States Dispensatory" calls it a poison which causes disease and death. The English and the French Dispensatories also say the same thing.

116. It is easy to prove for ourselves that alcohol is a poison. It will quickly kill any little insect or animal that happens to fall into it. If

114. What are the names of these books? Who study them? What could you find in them?

115. What does the "American Dispensatory" say of alcohol? What does the "United States Dispensatory" call it? What others say the same thing?

116. How can we prove it a poison? In what way could you use it to show this?

you are making a collection of Natural History specimens you can hardly adopt a quicker method of putting the little creatures out of misery than to plunge them into alcohol. It also poisons any sort of animal that might happen to swallow it.^a

117. If you should bathe your eye in alcohol it would smart and ache, and for a while you could not see to read with it, simply because of the poison. If you should bathe the tip of your tongue in alcohol and then put a bit of sugar on it, you could not taste the sweet. The nerves of taste would be paralyzed by the poison. I would advise you not to try either of these experiments with this nor with any other poison. Water would be much more refreshing to bathe the eye and the tongue.

118. There is no need that you should experiment on human beings with alcohol. Too many are trying it for themselves, and you have only to look on and see the effects. You can judge by these much more surely than they can who drink it, for their nerves are so paralyzed by the poison that they can not judge anything correctly.

117. What would happen if you should bathe your eye with it? If you should bathe the tip of your tongue with it? What would be much more refreshing?

118. Where may you see experiments without trying them? Why can you judge more correctly of its effects on people who drink than they can?

119. People also misjudge the power of this poison, because they do not stop to think how much it is diluted in beer and cider. These have only one part alcohol to ten, fifteen, or twenty parts water. Because these drinks do not kill quickly, they say that alcohol must be a "very slow poison." But a slow poison may be quite as horrible and quite as sure as a quick poison.^a

120. It is an easy matter to dilute the strongest poisons so that they can be taken, a little at a time, and not kill outright.^a Arsenic is well known to be a violent poison. Yet there are people in Europe and Asia who take it in small doses as alcohol is taken in beer and cider, and they fancy that it does them good. They often die miserable deaths.^b

121. We shall see, as we go on with our studies, that those who use alcoholic liquors show more or less signs of being poisoned, according as they take more or less alcohol. Very many are frightfully diseased in consequence, and die horrible

119. What other reason is there for misjudging the power of this poison? What proportion of alcohol have these drinks? Why is alcohol called "very slow poison"? What is said of a slow poison?

120. What is said of diluting poisons? What case is given? How is arsenic used? With what consequences?

121. What shall we see as we go on? What is said of many of those that drink?

deaths.^a That is enough to show that alcohol is a poison.

122. It is also a poison to vegetation. Pour some upon young plants, or moisten seeds with it, covering them with a tumbler to keep in the vapor (ex. 16), and it will kill them.^a A farmer in Hanover was carrying quite a quantity of gin to his men in the harvest-field when he accidentally spilled it. It killed the grass on which it fell, scorching it as by fire. When he saw this effect he gave up its use entirely.

123. To what else is it a poison? Describe experiment 16
Relate what occurred to a farmer in Hanover.

Review.—State the origin and meaning of the term intoxicated. What particular organs does it affect? What other substances produce a like effect? What is said of foolhardiness in poisoning with alcohol? What do learned men say about alcohol? What are Dispensatories and what do they say? How does it affect insects and animals? How could you try experiments on yourself? Why is there no need to experiment upon yourself? Why do people misjudge the strength of the poison? What illustration of slow poisoning is given? What shall we see as we go on? What does alcohol do to vegetation?

LESSON XI.

ALCOHOL IN THE STOMACH.

123. If you look into the big books called Dispensaries, mentioned in our last lesson (114), you may see that alcohol is also called a solvent. It will dissolve many things—many kinds of drugs. You may try it with camphor or with shellac (ex. 17). Put one ounce of shellac into a vial, cover it with alcohol, cork it, let it stand twenty-four hours, and you will have a quick-drying varnish, very useful for many purposes.

124. While alcohol may be good to burn in a lamp, or to make a varnish, it does not follow that it is good to put into the stomach. The stomach may be called the kitchen of the body, where the food is prepared to nourish the different parts. We have already seen (92, 93) that

Questions.—123. What else is alcohol called? What will it dissolve? Describe experiment 17.

124. What two things is alcohol good for? What does not follow? What may the stomach be called? What have we seen in 92 and 93? What does alcohol do?

alcohol does not dissolve or digest our food. The gastric juice does that. But alcohol, the mighty solvent, dissolves or kills the gastric juice.^a

125. The gastric juice is a precious solvent, manufactured in the stomach for the express purpose of dissolving our food. We call it precious, because it is designed to do perfectly the very thing we wish to have done, and because if it is destroyed we can not get a supply elsewhere.

126. If we put these together, we find that alcohol is the more powerful solvent of the two, for it destroys the gastric juice. But after it has done that it can not do the work of the gastric juice.^a It is like the dog in the manger. It can not dissolve the food itself, and it lets nothing else dissolve it.

127. It would not be worth while to try it on yourself, just to see whether it will poison you. It has been tried on other people again and again. A drinking man began to drink one day just after a hearty dinner, and remained drunk overnight. When he grew sober, the next day, he was taken sick at the stomach, and an emetic

125. What is the precious solvent of our food? Why do we call it precious?

126. Which is the more powerful solvent, alcohol or the gastric juice? What does it do? Why is it like the dog in the manger?

127. Tell what happened to a drinking man.

brought to light the fact that his dinner had lain there all that while undigested.^a

128. It is very common in some countries to drink ale, or porter, or wine, or cider, or stronger drinks, with food. But this does not prove that it does any good. The truth is, that a little alcohol can do a deal of mischief just at this time. It can quite spoil all the gastric juice in the stomach.

129. An experiment^a will show the truth of this (ex. 18). Get a fresh pig's or calf's stomach, rinse the gastric juice out of the inside with a very little water, and put the water in a vial. It will be milky white. Add a little alcohol to it, and the white part will settle to the bottom. This is the pepsin. After this is gone, the rest of the gastric juice will not dissolve food.

130. In 1822, Alexis St. Martin, a Canadian boy, had a gun-shot wound in his side, which healed up, leaving an opening into his stomach.^a Through this opening his physician, Dr. Beaumont, often took out gastric juice and made various experiments with it. By this means we

128. What is common in some countries? What does it not prove? What is the truth? What can it spoil?

129. Describe experiment 18.

130. Tell about the Canadian boy. What did Dr. Beaumont do? What have we found out?

have found out many facts about digestion and the effects of alcohol in the stomach.^b

131. Nothing can be done in the way of digestion so long as the alcohol is in the stomach. It is an intruder; it has no business there, and the sooner it is sent out the better. It is soon taken through the skin of the stomach, almost as you would pitch a thief out the window, and in a few minutes, if the quantity is not large, it is all taken out.

132. The stomach now sets to work to make more gastric juice, and if no other interference comes, the food is digested. But this interruption, and this making more gastric juice, is a great tax on the stomach, and the work is not so well done. The stomach often becomes diseased, and the invalid is said to have dyspepsia.^a With such stomachs, drunkards sometimes eat very little.

133. When more and stronger drinks are taken the effects are still worse. We learned (99) the violent action of alcohol in contact with the moist,

131. What quite hinders digestion in the stomach? What is then done with it?

132. What does the stomach do next? What is a great tax on the stomach? What follows?

133. When are the effects still worse? What will alcohol do to the skin of the mouth? What does it do to the stomach? What did Dr. Beaumont see? What did Dr. Sewall see? What did he make?

tender skin of the mouth. Even during the short time it remains in the stomach it does immense harm. The stomach becomes red and inflamed, and then covered with sores. Dr. Beaumont sometimes saw these sores in the stomach of St. Martin after he had been drinking.^a Dr. Sewall, of Washington, D. C., also saw these sores, and the condition of the stomachs of many drunkards, and he has made charts which picture out these bad conditions.

134. The stomach can not feel very distinctly. If it had nerves like our finger-tips, our attention would be so much taken up with the ordinary digestion of our food that we could not properly attend to our work and our studies. So it may even have sores without our knowing it. St. Martin complained of no bad feeling, even when his stomach was much diseased. We ought, then, to be all the more careful of what we put into the stomach, because we may hurt ourselves seriously without feeling it at once.

135. These sores and ulcers increase with the continued use of alcoholic drinks. There are also

134. What is said about the feeling of the stomach? What is said about sores there? What is said of St. Martin's feeling? Why should we be all the more careful?

135. How do these sores increase? What else is there? How does a man look when he has such a stomach? How does he feel?

streaks of inflammation and sometimes of blood. Do you wish to know how a man looks when he has such a diseased stomach as that? You can easily find such men in most places. They have red, pimpled, or blotched faces,^a bloodshot eyes, often violent headaches, great thirst, and no appetite. Such a stomach does not call for food, but for more drink, to quiet for a little while its wretched feelings.^b

136. When a man is in this condition, any disease that comes along easily takes him off.^a Besides this, diseases often result directly from the drink. That terrible disease, cancer in the stomach, sometimes makes its appearance, and the man dies with slow and lingering torture.^b

137. Certainly, with such a stomach, he could have no enjoyment of life. Dearly, indeed, does he pay for his self-indulgence, or his weak compliance. He may have begun when he was yet a boy, and he and his schoolmates thought it would be smart and manly to have "a drink of something." It is much wiser to find out what that something is before you drink it.

136. What does disease do to such a man? Mention one disease that sometimes results directly from drink.

137. What is said about the drunkard's feelings with such a stomach? What is he paying for? What would have been the wiser course?

Review —What else was to be found in the Dispensaries ? Describe experiment 17. What does it prove ? What does aleohol do in the stomach ? What follows ? Give an instance. Are alcoholic drincks suitable to take with food ? Deseribe experiment 18. What does it show ? Describe the case of Alexis St. Martin. What did we lecaru from it ? Who has made charts of the drunkard's stomach ? What becomes of the alcohol ? What is then done in the stomach ? What is the state of feeling in the stomach ? What conditions follow continued use ? What are the outward signs ? What diseases follow ? How may all this be avoided ?

LESSON XII.

ALCOHOL AN INTRUDER.

138. WE learned in our last lesson (131) how promptly alcohol is turned out of the stomach.^a If it could only be turned directly out of the body it would save a deal of trouble. It might come up the same way it went down, and sometimes a part of it does.^b It is not uncommon to see a drunkard trying to get rid of it in that way.^c It might also be prevented from going down, and that would be still better—the only right way.

139. If we follow alcohol through the body we will find it everywhere treated in the same way, thrown out as fast as possible.^a First the portal veins, as they are called, take it up as it comes through the sides of the stomach, and they carry it to the liver, as they do all the fruit-juices and other fluids that are taken from the stomach.

Questions.—138. What did we learn in our last lesson? What would be a better way? Is that ever done? What would be the only right way?

139. If we follow alcohol through the system what shall we find? What takes it up when it leaves the stomach? Where does it go next?

140. The liver takes out a little and sends it off in the bile. We will not stop now to look at the mischief done to the liver. Every organ to which the alcohol comes seems anxious to get rid of it, and dilutes it and hurries it on. None of them can drop it, and if it stops anywhere it makes a sore.^a It soon goes to the heart, and the heart hurries it on to the lungs, and here some of it comes out.

141. It is alcohol still. It can be smelled in the breath. Sometimes it goes all that round and comes out in the breath in less than ten minutes. The blood trying to get rid of it, throws out all it can.^a

142. Much of it goes back in the blood to the heart, and the heart beats a little more quickly^a and sends it out again, this time to the arteries, and it goes all through the body. When it comes to the skin more of it is thrown out through the little pores by which the perspiration comes. Alcohol increases the perspiration to some extent. What comes out here is alcohol still.

140. What does the liver do with it? What is done by every organ? What happens if it stops anywhere? What other organs does it visit?

141. What happens to it in the lungs? How can you tell that it is alcohol when it comes out?

142. Where does it return from the lungs? What does the heart do with it? What is done when it reaches the skin? What does alcohol do to the perspiration?

143. This makes the drinker smell of alcohol all over. If you come very near a man that drinks much and often you can discover it. All his clothing smells of it. He has turned himself into a distillery, throwing out alcohol. Some of it goes off through the kidneys, and the remainder goes back to the heart, to go the same round again, till finally all is thrown out or got rid of in some way.^a

144. If the quantity drank is considerable it takes some hours and a good deal of extra work to throw it out. If a man takes two ounces of alcohol it is usually twenty-four hours before he gets rid of it all. And it does a deal of mischief on its way.

145. You are to notice that when it is found in the blood and when it comes out, it is alcohol still. The system has not been able to use it for any purpose whatever. It can not make it into bone, muscle, nor sinew, as it does bread, potatoes, and other food.^a

146. When bread has been eaten it is never

143. How do we perceive it? Into what has the man turned himself? What becomes of the remainder of the alcohol?

144. How long does this take? If a man takes two ounces, how long does it take him to get rid of it?

145. What are you to notice? What has the system not been able to do? What can it not make?

146. What is said of the bread you eat? What becomes of it? What does it do for us?

found as bread in the blood, brain, liver, nor lungs. It does not leave the stomach as bread. The stomach digests it and makes it into food to feed the muscles, the bones, the brain, and every other part of the body, and that is the way in which we are kept going.

147. Whenever a little particle of the muscle wears out, a little particle of this good food made from the bread or something else we have eaten, is picked up out of the blood to replace it, but no particle of alcohol can be made use of in that way.^a

148. When people found that it was of no use for any such purpose, they said it was burned in the body to keep it warm. But after a while they found out that the body was not so warm after taking alcohol, and so they were obliged to give up that notion.

149. They have come to the very sensible conclusion that alcohol is merely an intruder, and after we put him in, the internal organs try to turn him out again. They often manage to do this, but they get a deal of hurt in doing it, and wear out much faster with this extra work. We

147. When a particle of the muscle wears out, how is it replaced? Can alcohol be used in the same way?

148. What was said next about alcohol? What did people find out?

shall learn in our future lessons some of the mischief that is done in this way.

149. What sensible conclusion has been arrived at? What do the organs do? What happens to them? What will be taught in future lessons?

Review.—What is the title of this lesson? What is the first method by which alcohol is often thrown out? Describe its route through the system. In what places is it expelled? Where can it be smelled? How long does it take to expel two ounces of alcohol? What are you to notice specially? How is it treated differently from bread? What did people say next about it? What sensible conclusion have they come to about it?

LESSON XIII.

THE DANGER SIGNAL.

150. ONE of the first things you notice in men who drink alcoholic liquors, is that their faces look flushed, the skin is red. Sometimes this redness is as dark^a as it is in a burn, where the skin is scalded. Let us see how the alcohol does this.

151. In Lesson IX we learned that alcohol paralyzes the nerves by absorbing some of their moisture, and that when this is done, they can not feel so clearly ; but the nerves do a great deal besides feeling. Some of them govern the motions of the body whether we know it or not.

152. Others control the circulation of the blood.^a When the little arteries give the blood into the little veins to send it back to the heart, the nerves hold the arteries so that they shall ad-

Questions.—150. What is one of the first signs of a drinking man ? What is this redness like ?

151. What did we learn in Lesson IX ? What is said about the nerves ?

152. How do the nerves regulate the circulation of the blood ? What happens when they are paralyzed by alcohol ? What happens then to the little blood-vessels ?

mit only the right amount of blood. When these nerves are paralyzed by alcohol they neglect their duty, and let in too much blood. The little vessels then become swollen with blood, and this shows through the skin.

153. This is the same kind of flush that is seen in the face of one who blushes.^a The surprise, or whatever the feeling is that causes the blush, stops the action of these nerves for a moment and the blood flows in and colors the surface; then the nerves do their duty again and keep it back. In the case of the drinker, the nerves are paralyzed so long that the blood-vessels become swollen, and it would take them a long time to recover. In some cases the vessels continue enlarged for years after the man stops drinking. This might well be called the drunkard's blush of shame for his wrong-doing.

154. Alcohol also deranges the entire circulation of the blood and especially in the heart. The heart beats faster, does more work, and so becomes overworked. Two gentlemen,^a Dr. Parkes and Count Wollowicz, by experiments, found that

153. What other flush is this like? Give the cause of blushing. What is different in the case of the drinker? How long may this bad condition continue? What might this be called?

154. What more does it do? What does the heart do? What did Dr. Parkes find out by his experiments?

when a man drank four ounces of alcohol, his heart did one-eighth part more work than it should do, and one-quarter more work than it should when he drank eight ounces.

155. That is a serious thing, as you would find if you had done a good day's work, and then you should be obliged to work yet another quarter of a day, or that you had to do the work of a day and a quarter in a day's time. Your heart beats all the time steadily, we will say 80 times a minute, but drinking eight ounces of alcohol would make it beat 100^a times every minute. Men often drink more than that.^b

156. If you were doing your duty steadily by running four miles an hour you would have some reason to complain if you were obliged to run five miles in the hour. The heart has reason to complain of the extra work put upon it by this drinking of alcohol for no good purpose. It follows that the heart wears out sooner, and the man dies sooner for all this extra work.

157. There are other dangers also, for this stretching of the little blood-vessels is not near

155. How might you find out that this is a serious thing? How does your heart beat steadily? When drinking eight ounces of alcohol, how would it beat?

156. How is this compared to running? What reason has the heart to complain? What follows?

157. What other dangers are there?

the skin only, but all through the body. It is in the lungs, the liver, the brain, and the heart itself.^a

158. Dr. Richardson, who has learned so much and taught so thoroughly about these things, says that the brain of a drunkard looks quite red and flushed, like his face, or even brighter. The brain in health is a pale pinkish gray white. He tells of a drunkard^a who was killed by the cars, and the brain was brought to him only three minutes afterward. It was plainly covered with a web of enlarged blood-vessels, which in their natural state could not have been seen without a glass.

159. Besides this, the alcohol makes the little red globules of the blood^a shrink by taking out their moisture. Then instead of dancing along through the blood-vessels, they crowd together and block up the way. This makes the blood-vessels much more likely to burst. If one should burst in the lungs, it might prove fatal at once, and blood gush from the mouth. If one should burst in the brain, the blood would press against the brain, the man would fall senseless,

158. What learned Doctor tells us much about these things ? What did he see in the brain of a drunkard just killed ?

159. What happens to the red globules ? What accident may this cause ? If a vessel should burst in the brain, what would the case be called ?

and perhaps die. Such cases often happen. They are called apoplexy.^b

160. We see then that this red flush gives two signs, a sign of shame and a sign of danger. It is truly a "Danger Signal."^a On railway trains a red flag or a red lantern is a sign of danger; so here nature hangs out, on the very face of the drinker, this red signal,^b but he is the very last one to understand it, or to take warning from it.^c

161. Some people mistake this sign for the rosy hue of health.^a They laugh at the "pale-faced abstainer;" the man who has not poisoned himself with alcohol, but he is far the wisest whose blood flows calmly and evenly in his veins, whose brow bears aloft the white flag of purity, peace, and safety.

160. Name two signs the red flush shows. What might we call this red flush? What is the Danger Signal on railways? Is the drunkard likely to understand this signal of danger?

161. What mistake do some people make? At whom do they laugh? Who is the wisest?

Review.—What sign of alcoholic drinks is shown on the face? What is the immediate cause of this? In what respect is this like blushing? What effect does alcohol have upon the heart? Where else are the blood-vessels out of order? What case is given by Dr. Richardson? What does alcohol do to the red globules? How does this cause apoplexy? Of what two things is this red flush the sign? How is this sometimes mistaken? Who is the wisest?

LESSON XIV.

IS ALCOHOL FOOD?

162. Much that is said in Lesson XI, "Alcohol in the Stomach," shows the difference between alcohol and a true food.^a Those who say that alcohol is food ought to prove it if they can.^b This they have tried to do in several ways, and one reason for saying that it is food is thus given: It is commonly made out of fruits or grains, and since these are food, alcohol must be food.

163. These lessons have already taught us that it is made by the decay of such foods, and decay spoils their nourishment. Rotten things are not good food.^a We do not usually let our food decay before we eat it, and if we should, we would not say that this makes it more nourishing.

Questions.—162. What is said of Lesson X? What ought those to do who say that alcohol is food? What is one of the reasons they give?

163. What have these lessons already taught us? Are rotten things good foods? What do we not say about the decay of foods?

164. Foods that have just begun to decay like sour milk or fermented bread may still have the most of their nutrition left in them (Lesson V), but they have lost their nourishment by just so much as they are decayed. You would not expect a half-rotten apple or mouldy biscuit to do you so much good as if it were fresh and sound. If it should stand and decay completely, as fruits and grains do in making alcohol, it would be worth about as much as the smoke and ashes that are made from burned wood.^a

165. It ought to be enough to say that it is a poison (Lesson X). We can not try it to see if it will support us like a food, because if taken it will poison us. Ordinary foods do not contain poison,^a and we should not call them good foods if they did. Doctors often tell those who drink not to take wine, spirits, or beer, on an empty stomach.^b We think *foods* ought to be specially suited to an empty stomach. Foods also do their proper

164. What about foods that have just begun to decay? How does alcohol differ from them? What would we not expect of a half-rotten apple or a mouldy biscuit? What would it be worth if completely decayed?

165. What ought to be enough? Why can we not try to live on it as a food? What is said of ordinary foods? What do doctors often tell those who drink? What ought to be specially suited to an empty stomach? How do foods do their proper work?

work quietly and kindly, but alcohol is violent and exciting.^c

166. Alcohol has been called a food, because sometimes after taking it people do not feel hungry. This is because it injures the nerves that control the stomach, and create the feeling of hunger. We remember that we learned in Lesson XI, how alcohol destroys the gastric juice which dissolves our food, so that the stomach must make more. It must then be some little time before the stomach can be ready to call for food, and any one not knowing might easily fancy it was because the stomach was satisfied.

167. If you venture to try alcohol so far as to take some in your mouth five minutes, it burns and smarts, and, if strong, it takes the skin off. If you try to swallow it, you feel like strangling. I advise you not to try it. But you can try milk in the same way with perfect safety. None of those bad results follow. Milk is certainly a good food. Try beefsteak or fruits and you will also find pleasant results.^a

168. Animals are good judges of food. Sup-

163. What other reason is given? Why do they not feel hungry? What did we learn about the action of alcohol in the stomach? What mistake would this lead to?

167. What if you should take alcohol into your mouth five minutes? What if you try to swallow it? What if you try milk or beefsteak?

pose you try your dog or your cat with alcohol (ex. 19). Get that which has very little water in it, and then get some milk also with but little water in it. Put some of each in a saucer, and set the two saucers down side by side. They will take the milk, but not a drop of the alcohol.

169. If you put it into food, they may take a little for the sake of getting the food. A boy once soaked a piece of bread in alcohol, and gave it to his dog; the dog ate it, curling up his lips to avoid the bad taste. It made him sick, and he would never touch it again in any shape, but he ate beefsteak readily enough. Animals have sometimes been taught to take it, as they have been taught other bad tricks, but they never choose it first of their own accord, as they do their natural food.

170. We have seen (Lesson X) that alcohol is made of carbon, oxygen, and hydrogen only. Dr. Lees says that alcohol has nothing in it to feed the body with. "It has no iron nor salts for the blood, no gluten, phosphorus, nor lime for the bones, and no albumen, a substance which

168. Who are good judges of food? Describe experiment 19.

169. Suppose you put the alcohol with the food. Tell what a boy once did. What followed? What have animals been taught? Do they ever take alcohol at first of their own accord?

170. Of what is alcohol made? What does Dr. Lees say? What does Baron Liebig say?

is the basis of every living organism;"^a Baron Liebig, a great German chemist, says about the same thing.^b

171. Still Baron Liebig thought alcohol might be burned in the body to keep it warm. Even if that were true, he says that it would be a very costly fuel, and that we could get the same heat out of sweet food like grapes, or starchy food like grains, at only one-fourth or one-fifth the cost.^a We have since found out that animal heat is not made in that way.^b (Lesson XIX).

172. Perhaps you will be told of some sick person or of some old toper that was kept alive on gin or brandy for weeks together.^a To this we reply, that people will sometimes live on very little, especially if they do not work. A man in New York city has lately been living for nearly six weeks upon nothing but a little water.

173. Many doctors and other learned men who have studied the matter, say that alcohol can not be called a food. Dr. Edward Smith, who has written a book on Food, says, "Alcohol is

171. What did Baron Liebig think? What if that were true? What have we since found out?

172. What may you be told? What may we reply to this? What has happened in New York?

173. What do many doctors and learned men say? What does Dr. Edward Smith say? What does Dr. T. K. Chambers say? What does Dr. Richardson say?

not a true food." Dr. T. K. Chambers says, "It is clear that we must cease to regard alcohol as in any sense an aliment." Dr. Richardson says, "It is no more food than chloroform or ether."^a

174. When the stomach is out of order, it is sometimes fancied that alcoholic drinks would be useful, in spite of the fact that they have no nourishment. Dr. Gill, of London, says of such cases: "The stimulus of alcohol is the last thing that should be resorted to as a remedy. The true antidote would most likely be found in rest, pure air, exercise, and the correction of some previous error in diet. Whoever resorts to alcohol in any form as an offset against feeble appetite, nausea, and depression is in league with death."^a

174. What is often fancied when the stomach is out of order? What is the best thing that should be done? What is the true antidote? Repeat the last sentence in the lesson?

Review.—What is the first reason given for calling alcohol a food? What is the answer to that? What is said about its being a poison? Why do not people feel hungry after taking it? If you should try alcohol, what effect would it have on you? Describe experiment 20. What does it prove? What experiment did the boy try? What does Dr. Lees say about the food in alcohol? What does Baron Liebig say? What reply can be made about people living on it? What does Dr. Chambers say? Dr. Richardson? Dr. Gill?

LESSON XV.

DOES ALCOHOL GIVE STRENGTH?

175. As there is no food in alcohol it can not give strength. Food is the only source of strength, and alcohol is not food. Some one says if it is not food it might help as drink. We have seen that there is much water in the body, but alcohol is not water and it can not take the place of water.

176. It does not act like water in the body. Instead of carrying the food, it spoils it. Instead of moistening the mouth as water does in saliva, it dries and parches it. Instead of moistening the eyes and brushing them clear and bright, washing them with alcohol in the eyelids would make them so inflamed you could not see with them.^a If alcohol instead of water should enter the nerves

Questions.—175. Why can not alcohol give strength? What is the only source of strength? What does some one say? What answer is made to this?

176. How does its action differ from that of water in the mouth? For the eyes? In the nerves?

it would paralyze them at once, and put an end to further suffering.

177. The water that is in alcoholic drinks may do some good. Certainly it prevents the alcohol from killing us outright. It is a fact that in almost all alcoholic drinks there is much more water than alcohol, and, therefore, those who take them are water-drinkers after all.^a In beer, wine, and cider, they get from ten to fifteen times as much water as alcohol.

178. As there are a great many men who take alcoholic drinks, we can easily compare them with those who do not. We shall find many of those who drink standing at street corners, around saloons, lounging in bar-rooms, or tramping about from place to place. If drink makes them stronger they ought to be at work. It is true that some do work, but not so steadily as those who do not drink.

179. They ought to be more steadily at work, more active, and able to earn more money than other men. They ought also to be richer. Their

177. What good does the water in alcoholic drinks do? What fact is stated? How much more water than alcohol in beer, wine, and cider?

178. How can we compare men? Where shall we find many of those who drink? If drink makes them stronger, where should they be?

179. What ought they to do? What about their families?

families ought to be better fed, better clothed, and more happy. If this "food" they pay so much for does not do this for them, what does it do?

180. We know very well that it does none of these things. On the contrary, it makes men lazy and negligent. Men in the harvest-field who drink, can not make out so good a day's work as those who do not drink. They often leave their work to get a drink, and before night they are asleep by the fence. Sometimes they lose a day or part of a day because they have been drinking so much they can not work.^a

181. If the drink does not help them to do better than they would without it, of what use is it? What becomes of the strength they think it gives them? What have they to show for all the money they have spent?

182. To learn why they suppose the drink makes them stronger, turn back to Lesson IX, and recall how it poisons the nerves, so that the man neither feels, sees, nor thinks correctly. He

180. What do we know? How does it affect men? What difference does drink make in harvest hands?

181. What questions are asked here? Can you answer any of them?

182. Why do men suppose that the drink makes them stronger? How does his feelings deceive him? Why can he not do so much as the sober man? How does he go on?

feels strong enough to do anything, but he can not do so much as the man who has not been drinking, because he has been using up his strength in fighting the alcohol.^a This he does not know. He goes on trusting his feelings, while he is blind to the truth.

183. A drinking man working beside a sober man *thinks* and says that he can do quite as much work. He never does it, yet he says he can every day, and he thinks the drink will help him do it. He always finds some excuse for the failure, but he never puts it upon the drink. He thinks, without that, he could not do anything.^a

184. Benjamin Franklin, at nineteen, was a printer boy in London. He worked among the beer-drinkers, but he drank only water and they called him the "American Aquatic." He did not care for that, but he tried to show them that he was stronger, and that he could do more work without the beer than they could with it.^a

185. He carried a large form of type in each hand up and down stairs while they could carry but one in both hands. He tried to convince

183. What does the drinking man think and say? What is said of his ideas and excuses?

184. Tell about Benjamin Franklin in London.

185. How did he show his strength? What argument did he use? What success did he have? What did they take in place of the beer?

them that there must be more strength in a penny loaf than there could be in the beer, and that to eat this loaf and drink a pint of water would make them stronger than merely to drink a pint of beer. After a while several gave up the beer, and like him, procured a good bowl of warm porridge, or oatmeal mush.

186. When total abstaining was a new thing in London, some very respectable workmen came to a Temperance meeting to oppose the movement.^a They thought beer was necessary to help them work. The chairman of the meeting asked if they had ever tried working without beer. They replied they never had. He then asked them to try it for a month, and they did so. At the end of that time they all met again, and the workmen cheerfully stated that they had worked better, felt stronger, slept better, and saved more money, and that they were more good-natured than when they drank beer. From that time on they drank no more.^a

187. There was once an English ship likely to be driven on shore and wrecked in a severe storm. The cold was great, the rigging was covered with

186. Relate what happened at the temperance meetings in London. What was the testimony of workmen who put aside beer?

187. Tell about the ship in the storm. What was given the sailors? With what effect? Who saved the ship?

icicles, and the captain gave gin to the crew so that they might endure the cold and work hard. They did very well for half an hour, then they wanted more, but soon they were tired out, and not able to work at all. Three boys were on board, who had been taught about alcohol, as you have been in this book. They did not drink. At last they were the only ones who could do anything, and if it had not been for them the ship would have been lost.^a

188. Prof. Parkes, who has examined this matter carefully, says that men engaged in any hard work, such as glass-blowers, or iron-founders, do their work more easily without alcohol than with it.^a

189. Dr. Richardson says that the drink is strong only to destroy, that it can not add strength to those who take it,^a and that they might as well think of looking for strength in hard work itself. Again he says that throwing alcohol out of the body is harder work than mining, or wrestling, or carrying heavy weights.^b Like all other hard work it exhausts strength.^c

190. He says further: "When you are tired rest, if it is only for five minutes. I rest by

188. What does Prof. Parkes say?

189. What does Dr. Richardson say? What again?

190. What should you do when you are tired?

lying down. Then take a light meal, say oatmeal or wheatmeal and milk. Afterwards take a warm bath, and then as soon as possible go to bed. These are all natural plans, simple and safe as nature herself.”^b

Review.—Give the reasons why alcohol can not take the place of water in the body. How do drinking men spend their time? How do abstainers commonly show themselves more industrious? If drink makes the drinker the stronger, how ought he to show it? Why does he think it makes him strong? Tell the experience of Franklin. Of the workingmen. Of the ship’s crew in a storm. What does Prof. Parkes say? Dr. Richardson? What are you to do when tired?

LESSON XVI.

THE FAT MADE BY ALCOHOL.

191. It is often said that alcoholic drinks make the drinker fat, but fats are not all alike. When you are sick you often grow thin, and when you recover you are said to grow fat again. Such fat means healthy blood and juices, and healthy muscle.

192. It is not so with one who takes alcoholic drinks. His blood becomes very impure, both because there is alcohol in it, and because the waste matters of the system are not properly carried off.^a The blood is so poisoned it can not do its work well. These waste matters are quietly tucked away in the most convenient corner, between the muscles or in the muscles as fat. If

Questions.—191. What makes fat? What is said of fats? Give a case of healthy fat.

192. What makes the drunkard's blood impure? Why can not the blood do its work well? What becomes of these waste matters? What will you see in a piece of butcher's meat?

you look at a piece of butcher's meat you will see that the fat is found in these places.

193. Bring home with you some of the fat or suet, and some of the lean meat or muscle, and look at the difference (ex. 20). The muscle is what we work with, it is elastic. Stick the point of your pencil in it and it soon closes up again. It is made of fibers, which when living can contract and help us make any motions we wish. You can feel the muscle in your upper arm contract when you raise your hand to your head.*

194. Stick the point of your pencil in the suet or fat, and the hole remains, for it is not elastic like the muscle. You can easily crumble it to pieces. It never has much life in it, and it does not help us work.^a When the system is in active health, the most of this waste matter is carried off. When fat increases to a great degree, it becomes a sign of ill health, and of disease.^b

195. Alcohol can not make muscle, and we can not always tell by the outside whether it is fat or healthy muscle that fills out the skin and makes

193. Describe muscle. How do we use it? Describe the fat.

194. How do they differ? What is said of this fat? Of what is much fat the sign?

195. Can alcohol make muscle? What can we not tell? What does this make people think? What happens when the disease is more advanced? Why is this?

it look plump and smooth.^a This deceives people and they think that alcoholic drinks are healthy, because they sometimes make people fat.^b When disease is more advanced, the same people may become thin, though they are still taking alcoholic drinks. This is when their stomachs become so diseased that they can not digest food.

196. Beer often increases the amount of fat because it loads the blood with impurities before the stomach becomes much diseased by taking alcohol. That it makes people fat, gives it much of its reputation as a wholesome drink, while it only loads down the system with impurities.^a

197. This fat does much mischief in another form. The little specks of fat circulating in the blood are picked up instead of living particles, and put into the muscle. If this goes on for some time, there may be many of these little specks all through the muscles. But this fat is not elastic. It can not contract or work like muscle, and it makes the muscle weak, causing what is called "fatty degeneration."^a People much troubled with this, find it difficult to do any work.

196. What does beer do? How? What reputation is given to beer? Why do people think it wholesome? What does it really do?

197. What other mischief does fat do? How does this fat differ from muscle? What is this disease called?

198. The heart is a strong muscle that has much work to do, and must work all the time or we can not live. Like the other muscles, the heart takes up the fatty particles until it loses much of its strength. When some extra task requires the heart to work a little harder, all at once it stops working, it can not make another beat, and the man dies.^a They call the complaint "heart disease," but it was the alcohol that brought it on.

199. If now a very thin slice of this heart should be held up to the light, you could see in it these specks of fat through a magnifying glass. We ought to be very much afraid of this kind of fat and not think that alcohol must be healthy because it makes people fat.

198. What is the heart? What does it do? Then what happens? What is this complaint?

199. How can the specks of fat in it be shown? Of what should we be afraid?

Review.—What is the difference between healthy fat and that formed by alcohol? Describe muscle and its uses. Describe suet. How does alcohol produce fat? How does beer get much of its reputation for healthfulness? Describe fatty degeneration. How does this produce heart disease? What is the appearance of the muscle in such cases?

LESSON XVII.

HOW ALCOHOL TREATS THE LIVER.

200. IN Lesson XI we learned that the alcohol when it left the stomach was carried by the portal veins directly to the liver.^a This is also true of fruit juices, water, the watery parts of milk, and other fluids.

201. If you can get a good look at the liver taken from a calf, a pig, or a sheep, it will give you a correct idea of what the human liver is like. It lies just beneath the lungs, through the middle of the body, and comes down a little below the ribs. It is the largest of the vital organs, and weighs in a healthy state from four to nine pounds (ex. 21).

202. The liver of any animal cut open at the middle will show a network of veins, arteries, and

Questions.—200. Where does alcohol go first after leaving the stomach? What else go there in the same way?

201. What will help you understand about the liver? In what part of the body is it placed? What is its size?

202. If you cut a liver open, what will you find? What do these bring?

other vessels of various sizes. These bring the blood and the fluids from the stomach and from other parts of the body to be cleansed.

203. The liver takes out some of the alcohol and sends it off in the bile.^a That which remains in the blood goes with it to all parts of the system, as we learned in Lesson XIII. In the case of the constant drinker, the alcohol comes again and again, and the liver soon becomes overtaxed, poisoned, and diseased.

204. Doctors who examine dead bodies say there is more alcohol found in the liver and in the brain than in any other parts. One of the first results is that the liver becomes swollen and inflamed,^a sometimes weighing from fifteen to twenty pounds. A dissector in a medical college, tells of finding one liver which weighed fifty pounds. This was in a drunkard who had lived a long time in the East Indies.^b

205. Europeans who live in hot climates, if they are not careful to eat food suited to the climate, are very apt to be troubled with "liver com-

203. Where does the alcohol go from the liver? If much alcohol is brought to the liver, what happens?

204. What do doctors say? What happens to the liver? What size does it gain? Where was an immense liver found?

205. What is said of Europeans who live in hot climates? Of whom is this especially true? What kind of a liver is produced after a while?

plaints" and fevers. This is especially true of those who drink alcoholic liquors.^a After a while the inflammation goes away, leaving a hard, knotty, diseased liver, which is called the "Hob-nailed liver."^b

206. The enlarged liver is so well known to come from the use of alcoholic liquors, that in some countries they feed geese with food soaked in alcohol^a (to make "goose-liver" pies), till they seem to be all "stomach," like some of the immense men you meet. It is not the stomach, but the diseased liver which puffs them out in this way, a sign of a very bad condition of the internal organs.

207. It may also be caused by gluttonous habits of eating, but it is never a sign of health nor of strength. When the liver for either of these reasons does not properly cleanse the blood, the body becomes foul and clogged, and the blood is so bad that any unusual exposure or overwork will bring on disease elsewhere.^a Many fevers and other complaints come from a diseased liver.

208. Boys and girls should take a hint from this

206. How is the large liver produced in geese? What human beings have the same appearance? What is it a sign of?

207. In what other way is it caused? What happens to the body in such a case? What kinds of sickness are brought on?

208. What hint should boys and girls take? What articles increase the work of the liver? What is more wholesome?

and avoid bad eating as well as alcoholic drinks. Sweetmeats, cake, and candies increase the work of the liver and make it unhealthy. Good, ripe fruit is far more wholesome.

209. Overeating is also very injurious to the liver. If you learn to control your appetites, you will gain in health by it all through life, and you will not be so likely to feel a craving for something more than wholesome food and drink. Some men who can not control their appetite for drink, did not, when boys, control their appetites for "goodies." Self-control in such matters means a moderate use of things that are good and total abstaining from poisons.

209. What else is injurious to the liver? How will you gain health? What is said of some men? What does self-control in such matters mean?

Review.—What specimen and experiment will help you? How? What are the relations of alcohol to the liver at first? How does this affect the size of the liver? What is "hob-nailed" liver, and how produced? How are geese sometimes fed to produce diseased livers, and for what purpose? What effect does this have on the blood? On the health? What diseases does it bring on? What else makes bad livers? What articles should you avoid? What advantage will it be to you to control your appetites? What is self-control in these matters?

LESSON XVIII.

ALCOHOL IN HOT CLIMATES.

210. THE reasons people give for drinking are very amusing. They take alcoholic drinks to make them strong when they have work to do, to rest them when tired, to warm them up when cold, to cool them off when warm, and for many other reasons.

211. The cause of all this contradiction is simple. Alcohol dulls or stupefies their nerves so that they do not *feel* the weariness, the cold, and the heat, as they do when they are in their best condition; and it destroys their acuteness in other respects. Neither you nor I would wish to be a clam or an oyster, so that we could have less feeling than we now have. Heat and cold may hurt drinkers quite as much as others and they not know

Questions.—210. What are some of the contradictory reasons given for drinking?

211. What is the cause of all this? What creatures feel less than we do? Should we, therefore, wish to change places with them? Why do not the drinkers feel the heat or the cold that hurts them?

it, because they have poisoned and stupefied their feelings.

212. We have already seen that in hot climates people are very apt to have liver complaints. Alcoholic drinks hurt the liver; and they are doubly hurtful in hot climates. The very common practice of taking brandy to keep off malaria is therefore a fatal mistake. This is supposed to be one great reason why Europeans are not able to endure the hot climates of Africa and Asia.^a Dr. Parkes, an English army surgeon of high repute, says that "these are precisely the climates where alcohol is the most hurtful."^b

213. Sir John Hall says: "My opinion is that neither spirits, wine, nor malt liquors are necessary for health." He adds that the healthiest army he ever served in was at the Cape of Good Hope, where the men had no liquor. They were subject to much hardship and great exposure to the weather. Sickness made its appearance as soon as the men began to get liquor.

214. Some English officers, taken prisoners by

212. What complaints prevail in hot climates? Why are alcoholic liquors doubly injurious in hot climates? What fatal mistake is made? What is this one great reason for? What does Dr. Parkes say?

213. What does Sir John Hall say? What does he add about the army?

214. What happened to some Englishmen in the rebellion in India? What was the effect of their temperate fare? What made them sickly again?

the natives during the rebellion in India, were shut up in dungeons, with no food but rice, and no drink but water. After some years, they were released and they returned to the army in perfect health, though many of them were ailing when captured. Here they found themselves high in rank by the death of officers who had been enjoying a "good table," with plenty of wine and brandy. When they took up their drinking habits again, they became sickly as before.^a

215. Stanley, the American traveler, went safely through his wonderful adventures in Africa, as a total abstainer. So also did Livingstone.^a Bruce, who explored Abyssinia one hundred years ago, says: "I lay down as a positive rule of health, that spirits and all fermented liquors should be regarded as poisons, and, for fear of temptation, not so much as to be carried along with you."^b

216. Backhouse, another European traveler in Africa, says: "I have traveled over sands so hot that the very dogs howled with pain while treading on them, and the water was so bad that we had to conceal the taste with coffee. There is no single act of my life to which I look back with greater satisfaction than to the adoption of total abstinence."^a

215. What is said of Stanley? What does Bruce say?

216. What does the traveler Baekhouse say?

217. Men who work in hot places or in the hot sun also find it much better not to use alcoholic drinks of any kind.^a Cases are given of glass-blowers, furnace men, iron founders, blacksmiths, machine makers, and others who did their work better and suffered less without alcoholic liquors.

218. The drinks which men use in the place of liquors are tea, coffee, extract of meat, lemonade, and juicy fruits, but most largely oatmeal and water. This is sometimes made into a thin gruel by boiling and perhaps sweetened, but usually it is mixed cold in the proportion of one pound (fine ground) to a gallon of water, or one tablespoonful in a tumbler. Let it stand a few minutes before using.^a It is nutritious, refreshing, and peculiarly satisfying.^b

219. This oatmeal drink has been used for many years at the Brooklyn Navy Yard (N. Y.), at other Government works, and in many places in Europe—the men drinking freely in the hot test weather without any bad effects.^a

220. Drinking-men are also very liable to sun-

217. What is said of men who work in hot places? What cases are given?

218. What do men use in place of liquors? How is the warm oatmeal drink made? How is the cold drink made? What is said of it?

219. Where is this oatmeal drink used?

220. What is said of liability to sunstroke? What happened in St. Louis? What does Dr. Rush say?

stroke.^a Most of the sufferers in St. Louis during the heated term of 1879, were not total abstainers. Dr. Rush says: "As well might we throw oil into a house when the roof is on fire in order to prevent the flames extending to the inside, as to pour ardent spirits into the stomach to lessen the effects of a hot sun upon the skin."^b

Review.—What are the common contradictory reasons for the use of intoxicating drinks? What is the cause of the apparently opposite effects? Why are alcoholic drinks doubly hurtful in hot countries? What does Dr. Parkes say? What does Sir John Hall say? What happened to some English officers in India? What is said of Stanley? Of Livingstone? What does Bruce say? What does Backhouse say? What is the experience of men at work in hot places? What drinks are used in their place? How are the oatmeal drinks made? When are they used? What are the relations of alcoholic drinks and sunstroke?

LESSON XIX.

ALCOHOL AND SEVERE COLD.

221. ONE of the best proofs of the deceitfulness of alcohol has been found in studying its relations to cold. Almost everybody once thought and said that it was good to keep out the cold. Many took it for this who had never taken it for any other reason. Many would still agree with the young lady who said during a very cold ride in a country stage: "If I had not been a Good Templar, I should have taken a glass of wine before I left home to keep me warm."

222. People do this because they *feel* warmer for a few minutes after taking alcoholic drinks. Lesson XIII, "The Danger Signal," shows us why the drinker feels warmer at first. More of

Questions.—221. Where has one of the best proofs of the deceitfulness of alcohol been found? For what has it been much used? Mention case of young lady.

222. Why have people done this? Where shall we find an explanation? What is it?

the warm blood flowing to the surface, makes him feel warmer on the outside.^a

223. All this heat that comes to the surface is going out of the body. This makes the drinker colder, and very soon he feels more chilly than he would without the alcohol, while he is far more likely to "take cold."^a He does not think of laying this to the alcohol, because he felt warmer immediately after taking it,^b and he probably takes more.

224. This soon numbs his feelings, so that he can not tell whether he is cold or warm. He calls it "comfortable," and he is very sure that the alcohol has done him good. He soon becomes stupid. If it is very cold he freezes his nose, cheeks, fingers, or feet, and in many cases he dies, for it is no uncommon thing to hear of drunkards freezing to death.^a If alcohol really warms the drinker, he who drinks the most ought to be the warmest and the safest, while the truth is that he freezes the quickest.

225. A young girl taking a long, cold stage ride to reach the bedside of a dying mother, fell a vic-

223. Where is this heat going? What follows very soon? Why does he not lay it to the alcohol?

224. What follows when he takes more? What is the final result? What is not uncommon? If alcohol warms the drinker, what ought to happen?

225. State the case of the young girl. What killed her?

tim to this idea. When some fellow-passenger offered her brandy, telling her it would help keep her warm, she declined, for she had never drank brandy. As it was urged more and more, at last she took some. It did make her *feel* warmer, and so when more was offered she took it again. When they reached the end of the route she was dead; the brandy and the cold acting together had killed her.

226. In spite of many such warnings, people have drank alcohol to keep out the cold. One learned man said it burned up in the blood, and so helped to warm those who drank it,^a but he did not explain why so many drinkers were frozen. Then people used as an excuse what this learned man said, and they went on drinking to keep out the cold.

227. After a while men, putting facts and thoughts together, found that many intelligent workers and business men could do better without alcohol in severe cold.^a They found that lumbermen, hunters, and Arctic explorers all do much better without alcohol. The Hudson's Bay Company forbid the use of alcoholic liquors to those

226. What have people done in spite of all this? What did one learned man say? What did he not explain?

227. What did men do after a while? What did they find? What else? What does the Hudson's Bay Company forbid?

great number of servants and hunters whom they employ, and they have done so for many years.^b

228. At last Dr. Richardson began to make experiments on animals, using a little thermometer, the bulb of which can be put in the mouth or under the arm to tell how warm the body is inside.^a He soon found that after the first flush which caused the thermometer to rise half a degree, it began to sink so that the person became two or three degrees^b colder than ninety-eight, which is the standard in health.

229. He found that alcohol acted like cold,^a and that a man who had been drinking could be hurt or killed by the cold far quicker than one who had taken no alcohol. This is only one of many things that the learned Dr. Richardson has proven about the harm done by alcohol. What he says of it is well worthy of our attention, because he is a wise man, and because he spent many years in study and experiments. He became so sure that drink was bad, that he quite gave up the little wine he sometimes drank, and he has written some excellent books to show its badness to others.

228. Who began to make experiments? What did he use? What did he soon find? What is the natural heat in health?

229. What did he find alcohol act like? What was this a reason for? Why should we pay careful attention to what Dr. Richardson says? What has he done?

230. Many boys have read stories of the wonderful Arctic Expeditions of Captains Ross and Parry and Dr. Kane, who tried to go as near as they could to the North Pole. They seem almost like stories of going to another world. One of the best discoveries they made was that alcohol did not help keep out the cold.

231. Though Captain Ross was twenty years older than any other member of his party, he endured the cold far the best of them all, and he was the only one who drank no alcohol.^a

232. Brave Captain Parry says: "Spirits are not necessary. It is said they keep the cold out. I say they let it in. Few seamen have been more in the cold than I have, and I know spirits do harm."^a Captain Parry went nearer to the North Pole than any one till 1876; when Adam Ayles went still nearer. We will learn about him in another lesson.

233. These explorers and others, who live on salt provisions without vegetables or fruits, often suffer from a frightful disease called scurvy.

230. What is said of the Arctic Expeditions? What is one of the best discoveries they made?

231. What is said of Captain Ross?

232. What does Captain Parry say? What did Captain Parry do?

233. What is scurvy? Who have it and who escape? What company of men escape?

In many cases it has been observed, that those men who drink have scurvy, and those who do not, escape. The men employed by the Hudson's Bay Company, rarely drink alcohol, and they seldom have scurvy.

234. Our own Dr. Kane^a made it a rule to allow no use of spirits, and to employ no man who had been in the habit of using them. Perhaps you can get his travels from the library and read for yourselves. You will do well to notice in all your reading what is said about drinks and drinking; then compare that with what you learn in this book, and observe what wrong ideas people have who do not study the subject.

234. What rule did Dr. Kane make? Where can you read about Dr. Kane? What should you notice in all your reading?

Review.—What serious deceit has prevailed widely? What kept up the deceit? What opened people's eyes? Give some cases. Who began to experiment and investigate? How did he do it? Why are his experiments valuable? Give facts from Arctic Expeditions. What did Captain Parry say? What rule did Dr. Kane make? What should you notice in all your reading?

LESSON XX.

A BRAIN POISON.

235. THE brain is that part of the body with which we do our thinking. We may suppose that the mind lives in the brain. It controls the body through the nerves, all of which go from the brain, somewhat as the driver controls his horse by the reins. Or we may call it a telegraphic apparatus, where the brain is the instrument and the nerves the wires. As the instrument works *through* the wires, so the brain works through the nerves.^a

236. It would be a help in understanding this lesson, if we could get the brain of any animal and examine it.^a You will observe the twisted folds with fine soft white and gray matter inside of them. This matter is largely albumen, with

Questions.—235. What is the brain? How does it control the body? Why is it compared to a telegraphic apparatus?

236. What would be a help? How does the brain look? Of what is it made? What do we do with the brain?

some fat, a trifle of phosphorus, several other substances, and a large share of water. With this fine brain we do all our thinking.

237. It is built up in curious shapes, with membranes, nerves, and many blood-vessels. These blood-vessels bring the alcohol here almost as soon as it gets into the blood.^a The brain has no special outlet excepting through the nerves, and so the alcohol is not readily passed on.^b It remains here and does great mischief.

238. The brain is very moist, about as soft as a custard, so that it will hardly keep its shape after it is out of the skull.^a The first thing alcohol does here, as elsewhere, is to take up some of the water. The healthy brain is exactly moist enough and works nicely. Taking away the water destroys the balance, so that it no longer works nicely and the man shows it, in his looks, words, and actions.

239. Put a piece of brain into alcohol and see how it will be hardened in a few days (ex. 22). Doctors must sometimes examine the bodies of the dead to see what disease or accident killed them. They say that they know the brain of an alco-

237. How is it built up? How is the alcohol brought here? How soon? Why is it not readily passed on?

238. How moist and soft is the brain? What is the first thing the alcohol does? What effect does this have?

239. Describe experiment 22. What must doctors sometimes do? What do they say about the drunkard's brain?

hol drinker as soon as they put a knife into it, because it is so much harder than a natural brain.^a

240. Another form of albumen with which we are more familiar, is the white of an egg. It will help our ideas some, to see how alcohol hardens that (ex. 23). Put the white of an egg into a clear glass tumbler and pour in an equal quantity of strong alcohol. In five minutes white flakes can be seen, as if the egg had been mingled with boiling water, and in half an hour it will seem quite a solid mass, because the alcohol has taken out so much of the water. Alcohol loses much of its strength before it reaches the living brain, but the effect is like this so far as it goes.

241. There is a great difference in brains. The human brain is much finer and more delicate than the brain of any of the lower animals, and this it is that makes the greatest difference between man and these animals. We, through our finer brains, can learn about God, and this the animals can not do. With our brains too, we learn our duties to each other; we learn the sciences and many other things.

240. Describe experiment 23. What is said of alcohol and its effect?

241. What is said of the difference in brains? What can man do through his finer brain?

242. We can not tell how all this is, but we know that fine tools are needed to make fine work. We know that a cambric-needle can take finer stitches than a thick darning-needle. We know, too, that a fine-bladed knife can make a smoother cut, and do nicer carving than a coarse big-bladed jackknife. The finest needle and the best steel blade can be so rusted that they will only spoil any fine work we may try to do with them.

243. A fine brain may be spoiled by alcohol. Many of the finest brains have been so spoiled. If we have proper regard for this, the most precious part of our bodies, we ought to guard it with the greatest care against injury from any cause.

244. Alcohol is a brain poison.^a It robs those who take it of all that is highest and best in their nature, and makes them worse than the brutes. A man spoiled by alcohol is worse than an animal. The fact that alcohol has thus poisoned and ruined the brains of uncounted thousands, should make us careful to learn all we can about it. The

242. What is said of fine tools? What can we do with a cambric-needle? With a fine-bladed knife? How may they be spoiled?

243. How may a fine brain be spoiled? What ought we to do?

244. What is said of alcohol? What of a man spoiled by alcohol? What should make us careful to learn all we can about alcohol? What should make us fear and shun it?

fact that it will certainly injure our brains if we take it, should make us fear and shun it.

245. The use of alcohol hinders study and the improvement of the mind. Dr. Harvey Peet says, "In intellect, a confirmed drunkard is far below an average savage."^a Men of good minds are sometimes pointed out as drinkers, but it will usually be found that they learned the most of what they know, and did the most of their work before they drank much.^b

246. A boy in one of our city schools was sent home one morning tipsy, because he had taken alcohol as a medicine. Of course he could not study. Tippling has made more failures of scholars at school, and students at college, than all other causes beside. It wastes their time and their money, it befogs their brains, and worse still, it makes them reckless so that they do not care to improve. Many a student has been sent home from college in disgrace, because he indulged in drink, while his sober, manly classmates whom he may have laughed at as "slow coaches," have remained and graduated with honor.

245. What is said of the use of alcohol? What does Dr. Harvey Peet say? Who are sometimes pointed out as drinkers? What will usually be found?

246. What incident is told of a boy? What has tippling done? What does it do for students? What has happened to many a student? Who have remained?

247. Those who would excel as scholars, must keep their brains in the very best possible condition. This they can not do if they poison them with liquors in any shape.^a Dr. Brinton says, a single glass of wine will often suffice to take the edge off both mind and body, and prevent your doing quite so good work as you could do without it.^b

248. When General Harrison was elected President, he was the only one remaining of a graduating class of seventeen. All the others had gone to fill drunkards' graves. He had never drank any kind of intoxicating drinks.

249. You may see others indulge who are better scholars than you are, but they would be better still without it. If they drink, and you keep your brains clear, you will soon find yourself able to excel them. You will be almost sure to rise faster than they do. Certainly you will be far more successful without it than with it.^a

247. What must those do who would excel as scholars? What prevents this? What does Dr. Brinton say?

248. What is said about General Harrison?

249. What may you see? Does it benefit them? If you keep clear of it what may you be sure of?

Review.—Describe the brain. How does it control the system? How does alcohol affect it? Describe experiment 22. Describe experiment 23. What is said of the difference in brains?

What works great injury to the brain? What should make us very careful to understand and shun the action of alcohol? What effect has alcohol on the improvement of the mind? What effect has it often produced on scholars and students? What must those do who would excel as scholars? What does Dr. Brinton say? Relate the case of General Harrison and his schoolmates. Who will be the most likely to excel as students?

LESSON XXI.

ONE CAUSE OF INSANITY.

250. WE learned in our last lesson that the brain must have just the right amount of moisture in order to do its delicate work well. Alcohol takes out some of this moisture and that deranges the action of the brain, and deranges the man. He is crazy.^a The brain often feels it when but a small amount is taken.^b They say, "It goes to the head." People who make light of it, saying, "He is only tipsy; he will soon get over it," show that they do not understand the facts in the case.

251. Very bad things may come of it while it lasts; the drinker often makes himself ridiculous; not knowing what he is about, he beats and abuses his best friends, makes his home a place of terror,

Questions.—250. What must the brain have? What does alcohol take out? How does that affect the brain and the man? What is said about it?

251. What comes of it? What does the drinker often do? Who are afraid of a drunken man? Why?

and commits fearful crimes.^a This is so well known that women, children, and sometimes men are afraid of a drunken man, and with good reason. Women and children have been crippled for life or killed outright by drunken husbands and fathers. Many a man has been hurt or killed by men who had been drinking.

252. Some years since a gentleman, his wife, and a young girl were riding on a street-car in New York, when a drunken stranger began to leer at the girl and say insulting words to her. The gentleman protected the girl and rebuked the man. When they left the car, the drunkard followed them with a car hook and struck the gentleman so as to cause his death. Yet this drunkard was not a low-bred man. It was the alcoholic drink that caused him to do the deed.^a

253. There is no knowing what a man may do when he is drunk, and there is no safety near him. Men who are kind and gentle when sober, often become cruel and destructive when drunk. Women who are most delicate, tender, and thoughtful, may become coarse, sullen, and desperate by indulging in drink.

252. What happened in New York a few years since?

253. How do such drinks change men? How do they change women?

254. The cause of all this is that they lose control of themselves. Their brains can not act naturally. The finest parts of the brain feel the effect of the alcohol first, and so the finest thoughts and the best desires of the drinker are destroyed. Only the coarser parts of the brain are able to act, and they produce these coarse and dreadful actions.

255. When they too are stupefied and the man becomes dead drunk he can hurt no one.^a If he has not drank too much, the alcohol will pass off after a while, but it will require months and perhaps years for the brain to regain its best and finest action. Dr. Richardson says: "I really doubt if a man who has once been through the dead-drunk stage of alcohol, is ever quite the same healthy man he was before."^b

256. But this is seldom the last of the drinking. The person that has drank once is much more likely to drink again, as we will learn in another lesson, and the drinker's brain having been out of order once, more easily gets out of order again.^a So from occasional craziness the

254. What is the reason? What parts of the brain feel it first? What is the result? What do the coarser parts of the brain produce?

255. What happens when these are stupefied? How long before the brain will recover? What does Dr. Richardson say?

256. What is the person who has drank once likely to do? What makes it easier for the brain to get out of order? How does he become insane?

brain goes on to constant craziness, and the man becomes insane.^b

257. Those who have paid much attention to this matter say that the insanity of fully one-third of all who are in the insane asylums, has been caused by alcoholic drinks.^a Most of these cases are caused by the drinking of the insane person himself, but many are caused by drinking parents.^b Children may inherit this bad condition of brain and nerves just as they inherit the color of hair and eyes.^c Sometimes this makes them idiots.

258. When a man is insane or crazy all the while, whether from drink or other causes, he is not supposed to know or remember much about himself, but there is a form of insanity that comes to the man who poisons himself with alcoholic drinks, in which he knows that he is insane and remembers all his horrible fancies.^a

259. This is fearful, for the victim sees the strangest sights, often the shapes of frightful-looking creatures. He may know that they are

257. What proportion of insanity is due to this? In what two ways is it caused? What may children inherit?

258. What is the insane man not supposed to know? What is said of another form of insanity?

259. What does the victim see? Describe his condition. What might we suppose? Why does he not say so? Why has he no *will*? What is sometimes the result of these torments.

not there, still he sees them even with his eyes shut, and he can not help being frightened by them. We might suppose he would say, "I *will* not be afraid of them, they are nothing but shadows!" but the drunkard has no *will* left. He has given it up to the drink so often that the will-power is gone. These torments are sometimes so great that the sufferers kill themselves, to get rid of them.

260. This is called *delirium tremens*. It is caused by the drink directly, and not by suddenly stopping. Its best cure is entire and continued abstinence. Its victim is usually a hard drinker; but it is not at all uncommon for men to have it from frequently drinking a little.^a They may never have been drunk in their lives.

Men who recover, and go on drinking, bring back these terrible spells again and again, but the disease often proves fatal. These are a few of the fearful punishments visited upon him who poisons his brain with alcohol.

260. What is this called? Does it come only to hard drinkers?

Suppose they recover and then go on drinking again? What is said of these punishments?

Review.—How does alcohol derange the man? What comes of this? Give case of murder (252). How does it produce these fearful effects? What does Dr. Richardson say? How does this bring on insanity? How does this descend to children? Describe *delirium tremens*. What is its best cure?

LESSON XXII.

THE GREAT DECEIVER.

261. ONE question we must ask before going any further is this: Since alcohol makes such terrible mischief as we have seen, why does any one drink it? Surely the common sense of everybody ought to prevent their taking such a poison.

262. The first answer is, that people at the start drink but little, and they do not feel the worst effects. Besides this, no one when he begins expects to drink much. If boys or girls whom you know, begin to take now and then a drink of cider, wine, or beer, you probably could not find one among them who expects to become a drunkard. Yet, that is exactly the way in which drunkards begin.

Questions.—261. What question must we now ask? What ought common sense to do?

262. What is the first answer? What besides this? What is said about boys or girls that drink cider, etc.? Who always begin that way?

263. Speak to them about it and they will tell you that a "little doesn't hurt," or a "little is good." People do not talk thus about most other poisons. When a boy poisons himself with ivy, he does not say that a little feels good. If he should happen to get down a little arsenic, or Indian turnip, or Paris green, he would not say "a little is good," and be ready to take a little more whenever he could get it.

264. We will tell you what makes the difference. When he has taken any of these poisons he feels terribly sick very soon. The nerves quickly finding out that these are poisons, begin to send messages here and there and up to the brain. They make an outcry, call for help, and try to rally the vital forces to turn out the intruder. We call it pain. The nerves are like good watch-dogs. This is their way of barking at things which hurt, to tell us what is going on, that we may turn such poisons out and keep them out.

265. The first thing alcohol does when he gets

263. What will they tell you? State what happens about other poisons.

264. What makes the difference? What organs find out about the poisons? What do they do? What do we call it? What are the nerves like? Why do they give us notice of poisons?

265. What is the first thing alcohol does when he gets in? What is that like? What is the result?

in, is to lay his hand on the nerves to stop their outcry, and their sending messages.^a That is very much like what the cunning burglar does who poisons, or in some way silences the watch-dog, so that people do not find out the mischief that is going on until it is too late. So the brain not hearing any outcry thinks all is right.

266. Soon alcohol paralyzes the brain too, much as if the burglar should give chloroform to the man of the house, when, of course, no other sign of the mischief he is doing would be discovered. Now, suppose it was a trusted servant that had turned burglar. The master wakes up and finds mischief done, but the servant persuades him that some one else did it. That again would be just like alcohol. The man who drinks lays his bad feelings to everything else sooner than to the alcohol.

267. Besides this, if anything was out of order in the body before, and the nerves were sending messages or making a pain about it, that would be stopped too. If it was a side-ache, or an ear-ache, or any other complaint, and the alcohol kept the nerves from sending any more messages

266. What else happens very soon? What is this like? Suppose a trusted servant turned burglar?

267. What else might be stopped? What if there had been a side-ache or an ear-ache?

about it, stopped the *pain*, the man would think that the alcohol had done him good.

268. In that case he would say, "I am better. The alcohol has done me good. I can tell by my feelings," but the nerves with which he feels are poisoned and silenced, and he does not know it.^a He is deceived, and alcohol is the deceiver. It tells lies to the man that drinks it, all the way from the first glass down to delirium tremens and death. This is the great reason why the drinker is led on from one step to another, to the wonder of those who do not drink.^b

269. In abstaining is our great safety. If we do not drink we are not deceived by it, and we certainly can not be so much injured by it. We can know more about its effects than those who drink, because we have our senses sound, and we can see what is going on even in the case of the drunkard, better than he can see for himself. Never *think* of taking it to see the effect it would have, for the very first effect would be to deceive your feelings so that you could not tell anything correctly about it.

268. What would the man say? What would be the truth? What does alcohol do? What does this explain?

269. What is our safety? Who knows the most about the effects of the drink? Why must you never think of taking it? What would be the very first effect?

270. Some say of alcoholic drinks, that since they do not serve all people alike, every man must try them for himself, to decide whether they are good for him or not. Other poisons do not serve all alike, but that is no reason for trying the different kinds. The burglar does not serve all people alike, but that is no reason for letting him into the house. We would not let him in just for the sake of taking curious notes of what he did while there ; how much cake he ate ; how many jars of preserves he spoiled ; whether he went out by the door or the window. We prefer to keep him out entirely.

271. Having all men try alcoholic drinks for themselves, is exactly what the world has been doing for these thousands of years. Every man when he tried was deceived by this great deceiver,^a but he never seemed to find it out. In this way men went on from bad to worse, until some began to try not taking them at all. That works like a charm, because those who never take these drinks can not be hurt by them.

270. What do some say about aleoholie drinks ? What is also true of other poisons ? What is said about letting a burglar into the house ? What would we prefer ?

271. What has the world been doing ? For how long ? What happened to those who tried ? What else did some people try ? How does that work ? Why ?

272. If we could make everybody see how much people are hurt every time they take them, no one would drink, and all the world would be very much better, healthier, and happier. Vast numbers of people are still deceived and think they can tell by trying for themselves, or by doing as others do.

273. We are now trying a better way by getting the doctors and other wise men to find out the truth about all these matters, in which alcohol has deceived us. Then we collect all these proofs and study them carefully with all our senses awake. We need not poison ourselves once to know the truth, for we can compare all these facts with what we see in every-day life, and so prove their correctness. In this way we scholars at school can know more about the effects of drinking than the drunkards themselves; and best of all, we can forever keep clear of the drink. This is the only sure and safe way to unmask The Great Deceiver.

272. What would happen if we could get everybody to see that they are much better off without them? What do vast numbers still think?

273. What better way are we trying? Then what do we do? What do we not need? What can we know in this way?

Review.—What is the main reason why people go on drinking? What is the first thing alcohol does? How is it compared to a burglar? How might the man persuade himself that it did him good? In what is our safety? What has the world been trying? With what results? What are we trying now? What may we finally do?

LESSON XXIII.

SOME DECEITS OF ALCOHOL.

274. ONE of the most common deceits of alcohol is, that it gives a little of what some people call a good feeling. Young men and boys who think they would like a good time, very often drink for this reason. They are not only invited to have "a good time," but they see some one who has been drinking, singing, roistering, and making funny speeches.

275. It is not half so funny to him as it is to them. He is making a fool of himself, and they are enjoying nearly all the fun there is, while they are sober. There are, perhaps, from three to five minutes (not always that), when the drinker has a little of a light, easy feeling. This (see Lesson IX) is mostly due to his grow-

Questions.—274. Name one of the most common deceits of alcohol. Why do young men and boys often drink? What seems funny?

275. What is the truth? How long does the light, easy feeling last? What causes this? What follows?

ing lack of feeling. All is hazy and mixed, as you can see by looking into his eyes. After that brief period he knows still less of what is going on.^a

276. I once heard a lad of seventeen talking with his companion about it, as they sat in a railway station. He said: "I don't think there is much fun in the drink. If a fellow wants to have a real good time he must be wide awake, and have his senses all about him, so as to know what is going on." Not many boys who have tried it come to so sensible a conclusion.

277. Dr. Richardson has come to the same conclusion. He used to drink wine now and then, in company, or at dinner, but wise as he was he did not get at the truth by drinking. He found it out by studying, and then he tried giving it up, which was a wise and grand thing to do. He says that he enjoys the pleasures of society far more than when he drank wine, because he is never upset by the "seediness" and the "dreadful exhaustion" that follow wine-drinking.^a

278. The drinker pays dearly enough for the

276. What did the lad in the railway station say?

277. Who else came to the same conclusion? What did he do? How did he find out the truth? What did he try? What does he say about it?

278. How does the drinker pay for his short happiness? What does he not notice? What does he think? What does he do?

brief five minutes of a doubtful good time, by hours of headache and weariness, nausea, and wretchedness the next morning, besides all the terrible sufferings that come in after-years. Too often he does not stop to notice how alcohol has lied to him. He thinks only that another drink would quiet his wretched feelings; and so he poisons his nerves again and goes on from bad to worse, laying up trouble for the future.

279. Another reason given for drinking is, the pleasure of being with certain companions. Some may be offended if you should refuse to drink with them,^a but if you drink, you run a still greater risk of quarreling and getting seriously hurt. Many fast friends have quarreled over their cups and been killed.^b If you refuse politely your friend may be cool for a time, but in the end he will respect you the more, while you will have better and safer friends among those who do not drink.

280. The man who tries to make himself brilliant and witty in society by wine-drinking deceives himself, but not others, unless they too are tipsy.^a Many a lady has tried it, who came out

279. What other reason is given for drinking? What greater risk does the drinker run? If you refuse politely, what may happen? What in the end?

280. What of the man who drinks for brilliancy? What of the lady who does so?

with a mortified ambition and a ruined dress, if not a ruined reputation. This is a notable way in which alcohol plays the part of a deceiver.

281. Men who take it to make them sleep are deceived by it, for though they may lose consciousness, the stupor brought on by alcohol is not natural sleep.^a It does not refresh the wearied brain. That this must be so is evident, from the fact that in natural sleep the flow of blood to the brain is diminished. After taking alcoholic liquors the flow of blood to the brain is increased even to congestion, as we learned in Lesson XIII.^b Those who are wise will never take alcohol to make them sleep.^c

282. You have only to watch the drinking man to see how completely he is deceived. He does not judge correctly of anything. Full of silly conceits, he fancies himself rich when he has not a cent in his pocket; he lifts his foot high in the air to step over a stick, and if he falls, he fancies it was the sidewalk flew up in his face. He thinks he is making himself very agreeable when he is utterly disgusting. He is the greatest

281. What happens to those who take it to make them sleep? What is said of the stupor brought on by alcohol? What is the condition of the brain in natural sleep? What is its condition after drinking alcoholic liquors?

282. Show how the drinking man is deceived. Who is the greatest of all fools?

of all fools who allows himself to be fooled by alcohol.^a

283. The whole history of alcohol is one of deceit. Solomon said three thousand years ago, "Whosoever is deceived thereby is not wise."^a When it was first separated from the wine, where it had already done so much mischief, men thought it such a treasure that they called it the "water of life" (*aqua vitae*), but it has proved the water of death to uncounted myriads.^b Nearly all we need to know about it is to study its deceits and expose them. This we have been doing in these lessons, and we shall find many more to expose before we finish our book.

283. What is the history of alcohol? What did Solomon say? What did men think of it when first distilled? What has it proved? What is all we need to know?

Review.—Describe one of the most common deceits of alcohol. Illustrate by giving case of the boy; of Dr. Richardson. How does the drunkard pay for this slight enjoyment? Give another reason (279). Show the fallacy of this. Show how those are deceived who think they can do more work—of those who think they can sleep better. Mention other deceits. State the conclusion (283).

LESSON XXIV.

WOULD YOU LIKE A CLEAR HEAD?

284. In some of our late lessons we have studied much of the effect of alcohol on the mind and the brain. We have done this for two reasons: first, these are the most important parts of the man, and second, alcohol hurts the brain and nerves more than it does any other part of the body.

285. Among savages it may be the most important to have the biggest, brawniet body, so as to be able to strike the heaviest blow. Among civilized people it is far more important to have the best mind, to learn the most, to see the most quickly, and think the most wisely.

286. He who excels in these respects, will probably have the most ability and the most in-

Questions.—284. What have we been studying of late? What is the first reason for doing this? What is the second?

285. What may be the most important among savages? What is the most important among civilized people?

286. What will he who excels in these respects have? What will he be able to do? What kind of a man will these help to make? What must he know? What can not he afford?

fluence. He will be able to lead other people to think as he does, and to do much good. These all go far toward making a man at once great and good, but for this purpose he must know what he is about all the time. He can not afford to poison his brain once with alcohol.

287. Most school-boys have heard that the great and good Abraham Lincoln was once a poor boy, with hardly a chance for even common schooling. He grew up among rough drinking men and boys, but he never drank.

288. It is told of him that when a young man he was strong enough to lift a barrel of rum and drink out of the bung-hole; but he would not even swallow the mouthful, so careful was he not to poison himself. This shows his strength of mind to be as great as his strength of body. We can all have strength of mind if we will.

289. When he was an Illinois senator he still kept his principles. He once went down with the other Senators from the capital to a grand dinner that was given in Chicago, but he did not drink, though wine was as plenty as water. On their way back to the capital he was the only one

287. What is said of Abraham Lincoln's boyhood?

288. What is told of him when a young man? What does that show?

289. What happened when he was an Illinois senator? Why could he make speeches when the others could not?

of all those senators who was sober enough to make speeches at the stations when the cars stopped.

290. These were temperance speeches every one. Had he drank like the others, he would never have gone to the White House. His brains were not thought to be very superior to those of his fellow senators, but he took good care of them, made the most of them, and did not ruin them with alcohol.

291. Daniel Webster was a man with great natural abilities. He had good opportunities for schooling, and he improved them well. He became a great and eloquent man, but all the later years of his life were under a cloud, because he drank. If he had begun drinking early in life, probably he would never have become famous. However that may be, it is certain that in his last days he would have been far happier and more successful without the drink.

292. A public man was giving out the prizes at Huddersfield College, England, lately, and when he addressed the class, he told them about

290. What kind of speeches were they? What would have prevented his going to the White House? What is said of his brains?

291. What is said of Daniel Webster? What if he had commenced drinking early in life? What if he had never drank at all?

292. What was said to the graduates at Huddersfield College? In how many cases of failure was drink the cause of it?

some of his own schoolfellows. He said that some became men who deserved the success and reward they obtained, but many of the others had turned out wretched failures, and come to an untimely grave and wreck of fortune. In nine cases out of ten, the cause of their failure was drink. If he had to commence life again, he would never touch a drop of liquor.

293. Do you wish to know just how it acts to hinder success? We will give you a specimen. There was a lawyer who had a difficult case over which he studied till he was very tired. Then he took a drink, because he thought it would rest him and make him keener. It made him stupid, he lost his case, and with it \$20,000 for the man that employed him. After that some people would not employ him, fearing he might lose their cases.

294. A physician was called to set a broken limb. He was a little tipsy, did not set it properly, and made a bad joint of it; and the man sued him, recovering \$1,000. After that many other patients would not employ him. Some still sent for him, saying they would rather have

293. Tell how it worked in the case of the lawyer? Why did not people employ him after that?

294. Relate the case of the physician. What did some who afterward sent for him say? What happened to one of them? What did she learn from that?

him drunk than another man sober, but they would much rather have him sober if they could. One lady who said this sent for him once too often. He forgot to come, and through his neglect her child died. Then she learned how much better it would have been to have a doctor with a clear head who could remember his engagements.

295. If you become a merchant you will need a clear head for your business. Figures are troublesome now, but they will be still more so when you have big books of them to go through. The right way to secure a clear head is to begin now, and never take a single drink of the stuff that "steals away the brains."

296. Dr. Samuel Miller, of Princeton, says, that for many years in following the advice of his physicians he took a glass or two of wine daily. "During all that time," he says, "my health was delicate. More than six years ago, I broke off at once, and in less than a month all my mental exercises were more clear, pleasant, and successful." Prof. Silliman, of Yale College, suffered in health many years, and at last on giving up wine, "he was able to resume all his ardu-

295. If you become a merchant what will you want? Why will you want it?

296. What happened in the case of Rev. Dr. Miller? Of Prof. Silliman?

ous duties with constant exertion of both body and mind."

Review.—What are the most important parts of the human being? What is the difference between the savage and the civilized man in this respect? What was one of the secrets of success with Abraham Lincoln? Give details. What advice was given to the graduates at Huddersfield College? Give a case where a lawyer failed because his head was muddled with drink. A doctor. A merchant. Relate the case of Rev. Dr. Miller Of Prof. Silliman.

LESSON XXV.

DO YOU WISH A STEADY HAND?

297. WE admire the skill of a fine penman. It seems like a miracle that a man can make his hand go exactly where he wishes, and bring out all those graceful curves. We try it over and over again, but if we are beginners we fail.

298. If we keep on trying we may succeed, because we make the thousands of little muscles in our hands and arms try this over and over again, till at last we get them so that they can do it easily. This is what makes skill, not only in penmanship, but in painting, drawing, carving, and all sorts of handicraft. Some gain such skill more readily than others. Let us find out the reason.

299. Suppose you try (ex. 24) to hold out at arm's length any weight, a dumb-bell, an Indian

Questions.—297. What is said of the skill of the penman?

298. How is it gained? In what else is skill gained in the same way?

299. Describe experiment 24. Do all hold the weight alike steadily? What makes the difference?

club, a stone, a flat-iron. Hold it there a minute. Some can hold it quite steadily without a quiver, others tremble plainly. It is the condition of the nerves that makes the difference.

300. The nerves govern the muscles in all their motions. Some people have better nerves than others, but whatever may be the present condition of your nerves, there are some things which will always weaken your control of them. First among these hurtful things stands the use of alcohol.

301. It will not pay you to take alcohol to see how it treats the nerves. If you wish to see the results of such an experiment look among the tipplers and the sots. You will find among them many whose nerves are so badly hurt that they can not hold out their hands steadily with no weight in them.

302. You will find shaking hands and heads among those who use tobacco, for that, too, is a nerve poison, and its use often goes with alcohol. An artist once said that he could not paint for half an hour after smoking a cigar, and he threw away

300. How are the muscles governed? What is said of the nerves? What will weaken control of them?

301. Where can you see experiments in this line? What is the condition of their nerves?

302. Where else will you find shaking hands and heads? What did an artist once say? What did another young artist find? What would he not do?

the cigar. Another young artist found that after taking a glass of wine he could not paint correctly, and he left off the wine. He would not do anything to lessen his skill.

303. A violin-player when he was offered a glass of wine refused it, saying: "If I take it I shall lose my touch. My notes will be blurred, and I shall be the last to find it out, though others will see it readily." It is a noble thing to keep clear of self-indulgence for the sake of art, so as to be able to do the loved work perfectly. It is a still nobler thing to do it for the sake of being a more dutiful son, a kinder friend, a better citizen, and a more perfect character in every way.

304. There is no skilled work but can be better done without alcohol, and there are some master workmen who know that. In St. Aubin, Normandy (Europe), is a Mr. Anzoux, whose business it is to make anatomical models for all the world. He takes young boys and educates them to this work. He will employ no one who smokes or drinks. His seventy workmen never enter a wine-shop, nor waste a cent in smoke. Their heads are

303. Why did the violin-player refuse the glass of wine? What is a noble thing? What is still nobler?

304. Where is Mr. Anzoux? What is his business? How does he procure workmen? What does he require of them? What is said of his seventy workmen? What has this done for the village?

always clear, their hands always steady. They do excellent work, and lay up their money in the bank. This has turned the once beggarly, dirty village into a thriving town.

305. Few things show the possession of a steady nerve more clearly than shooting at a mark. In order to promote skill among the English volunteers, valuable prizes are given for the best shot. The highest is the Queen's prize, a gold cup worth £250, or \$1,250. This was won twice (in 1866 and in 1869) by a young Scotchman named Angus Cameron, an abstainer. He not only won the prizes, but he made the best shots that had ever been made.

306. This prize-winning was a time of glad triumph. His comrades carried him on their shoulders across the common, and, according to the custom, offered him the claret cup. This he declined, and modestly asked for ginger beer. There was no ginger beer to be had, and he drank nothing, and in doing this he showed self-control.

307. It was a fine triumph for temperance, and

305. What is one of the best things for showing a steady nerve? What is done among the English Volunteers? What is the highest prize? Who has won it? How often?

306. Describe the triumph. What was offered to the victor? What did he drink?

307. Who learned lessons from this abstainer? What is said of his hand? What is the advantage of doing without alcoholic drinks? What will most surely give a steady hand?

many a lad and many a soldier learned a good lesson from this unassuming little abstainer with "a hand as firm as a rock." There is nothing in the line of skill, there is nothing whatever that is worth doing at all, that can not be done better without alcoholic drinks than with them. Nothing will give a steady hand more surely than pure water.

Review.—How is skill obtained? Describe experiment 24. What may be learned from it? What have the nerves to do with skill and steadiness? What destroys command of the nerves? How did smoking hurt the artist? How did the glass of wine hurt another artist? Why did the violin-player refuse the glass of wine? What will self-denial help us do? What is done at St. Aubin, Normandy, and how is it done? With what results? Narrate the exploits of Angus Cameron. What lesson may we learn from them? What will most surely give a steady hand?

LESSON XXVI.

A CHAPTER OF ACCIDENTS.

308. ONE of the best advantages of having a clear head, is that you can be trusted to do any work in which great care or a good memory is required. If a boy should be sent by his father with a telegram, and he should allow something else to take up his attention and keep him by the way, so that his father should lose a large sum of money by it, he would not be called trustworthy.

309. But suppose instead of being a telegraph messenger for his father, he had grown a little older, and kind friends had secured a place for him as operator in a telegraph office where he would have many messages to send. If then he should allow a glass of beer or wine to distract his mind, he might send the message wrong, or send it to the wrong place. The same result might

Questions.—308. What is one of the advantages of having a clear head? Give an illustration of not being trustworthy.

309. How would this work in case of a telegraph operator? How might wine or beer affect him?

come if he were sick with the beer or wine he drank the night before.

310. The consequence might be a collision on the railroad, and the loss of life and property. You see by this how important it is to be trustworthy, and not to allow the brain to be deranged. Alcoholic drinks will do this more surely than almost anything else. Wherever you are, and whatever you do, you ought to wish to keep yourself in prime order, so as to be able to do your best. You can not do this if you take even a small quantity of alcoholic liquor.

311. A ship-master had taken his vessel through a gale, and thinking the worst of it was over, he was scudding along with most of his sails furled, when he went into his cabin. While there he took a glass of grog, and after a few minutes he returned to the deck. That one glass had changed his ideas and he ordered another sail spread. The sailors dared not disobey, but the mate coming up called out to furl the sail again, and they did so in great haste.

312. That one glass spoiled his judgment, and had it not been for the mate it might have cost

310. What might the consequence be? What is important? What ought you to wish? What will prevent this?

311. Give the case of the ship-master.

312. What spoiled his judgment? What does Dr. Brinton say?

them the ship and their lives also. Does that seem too much to be done by one glass? Hear what Dr. Brinton says about even a glass of wine or beer or cider: "A single glass of fermented liquor will often suffice to take the edge off both mind and body."

313. A single glass has many a time occasioned a serious accident. A railway engineer once took a glass of ale while the engine was taking in water. Soon after starting he put on more steam; the train whizzed along with frightful velocity and at last the cars fairly bounced off the track, rolled down an embankment, and sixty lives were lost. The engineer probably did not realize the danger. The glass of ale took off the keenness of his judgment as well as his feeling of responsibility.

314. A servant girl in Haverhill, Mass., was left alone for a few hours in a large country house. When her work was done she went down into the cellar and helped herself to some cider. After that she went out to the barn with a light and stupidly set the barn on fire. The flames spread to the house, and \$20,000 worth of property was destroyed by this "accident."

313. Give the case of the railway engineer. What was the consequence? What did the glass of ale do to him?

314. Give the case of the servant-girl.

315. Fires decreased one-half in Maine during the first fifteen years after the passage of the prohibitory law. This is a law which forbids the sale of liquors, and makes it difficult for people to get a drink. Accidents by fire and by water are common after drinking, because a man needs to have his wits about him to handle fire or to take care of himself on the water.

316. The oldest of the boys who saved the ship mentioned in Lesson XIX, afterward became a ship-master, Captain Brown, of the Kedron. He made it a point whenever he heard of a shipwreck, to inquire into the causes, and in more than two-thirds of the cases where he could learn the facts, he found that the drink was to blame.

317. When his ship lay at Canton, China, he set his own sober crew to counting the "accidents" that happened to drinking sailors on the ships around them; within three weeks they counted up twenty men that lost their lives; fell from the rigging, walked off the dock in the dark,

315. During what time did fires decrease in Maine? What is the prohibitory law? Why are accidents by fire and by water common after drinking?

316. What became of the brave and sober boy mentioned in Lesson XIX?

317. What did he set his crew to do? How many fatal accidents did they count in three weeks? To what cause were they due?

and other accidents that would never have happened but for the drink they had taken.

318. Page after page might be filled with the mere name and date of "accidents" that have happened on the water through the drink, and probably there have been many more when ships have never been heard of; no one left to tell the tale. On the other hand, in Orient, a small shipping community on the eastern end of Long Island, where they are all intelligent temperance people, they lost but one ship during the first twenty-five years of their temperance history. A noted traveler says: "In case of a storm or a sudden difficulty, I should most decidedly prefer the water drinkers to those who are under the influence of a stimulant. The latter are far more liable to accident."

318. What might these pages be filled with? What is the state of the case in Orient? What does a noted traveler say?

Review.—Give the illustration of the telegraph boy. How might telegraph operators cause accidents through drink? What will help keep you in your best condition? Give case of the shipmaster and his glass of grog. What does Dr. Brinton say? Give case of the railway engineer and his glass of ale. The servant-girl and her glass of cider. What effect has the Maine law had on fires? What does this prohibitory law do? What did Captain Brown find out? What did he make his crew find out? What is the case of the shipping of Orient? What does a noted traveler say?

LESSON XXVII.

CRIMES CAUSED BY ALCOHOL.

319. ONE of the worst things about alcohol is that it makes men wicked or helps them to be wicked.^a The most dangerous parts of any city are those that have the most rum-shops. The most wicked men and women are drinking people.^b

320. Drink makes some silly and some stupid. It makes others furious, or cunning, or violent, and these often do much mischief. They do not seem to have any care for the right. Drink paralyzes all the finer feelings of both mind and body. The man who put a hot iron on his wife's back would probably have killed her without caring.

321. Men who are kind enough when sober,

Questions.—319. What is one of the worst things about alcohol? What are the most dangerous parts of any city? Who are the most wicked people?

320. In what different ways does drink affect people? How does it affect the finer feelings? What is said of the man who put a hot iron on his wife's back?

321. What is said of kind men? What happened to such a one? What did he remember about it?

are often dangerous when drunken. Such a man once awoke from one of his frequent sprees in jail and asked why he was there. When told it was for murder, he showed much surprise and asked earnestly, "Does my wife know of this?" "It is your wife that you have killed," was the reply. He remembered nothing about it.

322. A tall, fine-looking man came home to his beautiful home one evening as usual. He had but lately begun to drink, and his little Freddie had not learned to fear him. Hearing his father's latch-key in the door, he ran to meet him, crying out joyfully, "Papa's come! papa's come." His father picked him up, swung him around, hit his temple upon the edge of the marble step and killed him.

323. Drunken men often take a malicious pleasure in doing mischief. If they have a spite against any one, they may take revenge when drunk, because when sober common-sense is gone they forget about the consequences. The law calls it crime just the same as if they were sober.^a

324. The great crime of the drunken man

322. How did the father kill his little boy?

323. What pleasure do drunken men often take? Why do they take revenge when drunken? What is gone? What does the law call it?

324. What is the great crime of the drunken man? What has he no right to do? What ought he to suffer?

comes in when he consents to drink that which takes away his senses. He has no right to poison himself and become like a wild beast let loose in our houses. He who does this ought to suffer the full penalty of the law for all the wicked acts he may commit.

325. He does not always receive punishment, because those who are hurt by him do not always complain. One man who was in Court for greatly abusing his wife, said to her, "I should not think you would tell that against me." "But, George," was her patient reply, "you have beat me a hundred times before and I have not complained of it!"

326. In such cities as New York, Brooklyn, and Chicago, scarcely a day passes, for months together, that the daily papers do not contain accounts of crimes committed by drunken persons. One of the most common of these crimes is that one man stabs another in a drunken quarrel.

327. If you see the daily papers of any large city having many drinking-shops, it would be an

325. Why does he not always receive punishment? What did the man say to his wife in Court? What was her reply?

326. What happens in large cities? What is one of the most common of these crimes?

327. Describe experiment 25. What does a Philadelphia Grand Jury say?

instructive experiment (ex. 25) to look over the police reports for one week, and see how many of the crimes are due to drink.^a A Philadelphia Grand Jury says of one month recently, that a careful examination shows nine-tenths of the crimes entered are due to drink. This is a common estimate of those who have studied the matter.^b

328. At the Courts where men make it their business to find out the truth about the crimes which have been committed, you will be sure to find that liquor had something to do with most of them.^a Ask the judges whose duty it is to listen to and decide such cases, and they will tell you that "Intemperance is the chief source of nearly all crime."^b

329. Go into the prisons and ask the prisoners one by one: you will find them nearly all drinkers. They will tell you, "I could never have done that deed, if I had not been drinking," or "I loved my boy, I would not have hurt him for anything. It was the drink that did it." Yet the drink would have done no harm if the man had not swallowed it; he was the one to blame.^a

328. What is the business of the Courts? What will you find there? What do the judges say?

329. What do the prisoners say? Who was the one to blame?

330. There are children also in prison or in the House of Refuge. They too suffer from drink. One of these said, "My mother was a drunkard; I stole food to keep me from starving." Nearly or quite all the wicked children in the street have known more or less of drink in their own homes and suffered from it in some way.^a

331. Where they have no alcoholic liquors, they have no crime. Vineland, N. J., is a place of 10,000 inhabitants; it has no grog-shop, and only one policeman, with very little for him to do. Greeley, Col., is a place of 3,000 inhabitants, without drink; it has no policeman and no need of any. Batavia, Ill., is a place of 3,000 inhabitants, without a drunkard, without a pauper, and without a criminal.^a

332. In all such places the people are healthy, happy, and industrious; none suffer from poverty, because they do not drink up their earnings; they are not tempted to steal, like those whom drink makes too lazy to work for what they want. All

330. Where shall we find children? What did one say? What is said of really wicked children?

331. Where do they have no crime? What is said of Vineland, N. J.? Of Greeley, Col.? Of Batavia, Ill.?

332. Describe the people in such places. Why do they not suffer from poverty? Why are they not tempted to steal? How might all this country be happy and prosperous?

this country might be as happy and as prosperous as these places if we should all learn to hate the drink and to banish it.

Review.—What is one of the worst things about alcohol? How does it cause crime? Relate cases of the man who murdered his wife. Of the father who killed his boy. How does the law treat such cases? Is he always complained of? Give case. What is one of the most common crimes? Describe experiment 25. What do you learn by it? What did the Philadelphia Grand Jury say? What do judges say? What do prisoners say? What did the little thief say? What places have no crime? How may we secure this happy condition for the whole country?

LESSON XXVIII.

ALCOHOL WASTES PROPERTY.

333. ALCOHOLIC drinks cause great waste of property. As we have seen, houses and barns are burned, ships and railway trains are wrecked, and injured and insane people and criminals must be cared for. All this uses up large amounts of property, and brings toil and poverty to many people.

334. Yet, previous to all this, comes the cost of the drink itself. To make these drinks requires millions of bushels of grain, grapes, and apples, with other material; the labor of many men, and the use of large and expensive buildings. Good authorities^a tell us that liquor to the amount of six hundred millions of dollars or more is drank in this country every year. It is supposed that it

Questions.—333. What does the use of alcoholic drinks do to property? What costly results are mentioned? What do these bring?

334. What comes previous to all this? What is required to make these drinks? How much liquor is drank in this country every year? How much does it cost to make and sell it?

costs to make and to sell it^b at least half that amount, or three hundred millions of dollars.

335. All that is clear loss, because the liquor is worth nothing after it is made. Some say this is not lost, because making it employs many men and supports their families. But they would get paid for their work just the same if they raised grain to feed people, and the grain would be worth something. Besides this, men can earn more at making the same value of almost any other goods than in making liquor.^a

336. If this grain were thrown into the ocean, everybody would cry out at the terrible waste. Made into liquor, it is worse than wasted; for, while it does no one any good, it brings many people much harm. To say that this whole six hundred millions of money is lost would not be true. The rum-sellers keep half this money and pay about fifty millions of dollars to the Government in taxes, which returns but a small part of the great sum which the rum-selling business costs the Government. The man who last buys the

335. Why is all this a clear loss? Why do some say it is not lost? What is the reply to this?

336. If this grain and fruit were thrown into the ocean, what would be said? Why it is worse than wasted now? Is this six hundred millions all lost? Who keeps half of it? What does he pay for taxes? Who loses the whole cost?

liquor loses its whole cost, since he has nothing to show for his money.

337. But notice, it is not the mere money that is lost—there is as much money in the country as before the liquor was made—it is the grain and fruit and labor that are lost to the value of three hundred millions of dollars every year. There remains nothing to show for them only the liquor, and that is worth nothing.

338. Some people talk of better markets for grain; and farmers sometimes ask, “What shall we do with all the grain, without the distilleries to use it up?” A very good reply was once given, “Feed the drunkard’s wife and children with it; they have gone hungry long enough.” If the drinker stopped drinking he would soon be able to buy it for them.

339. People sometimes fail to understand this matter, because they do not stop to think that in making bargains there are two values, and, if these are equal, there is no loss on either side.^a A man who pays two bushels of wheat for a pair of shoes

337. Is the money lost? What is lost? To what value? What remains to show for them? What is that worth?

338. What do farmers sometimes ask? What is a good reply to that?

339. Why do people fail to understand this matter? Give an illustration.

has them to wear, while some one else has the grain to eat, and both are satisfied. If he pays money, it is all the same—the money will buy wheat. So one has the shoes to wear and the other grain to eat, while each goes to work to earn more.

340. But, if he pays either his grain or his two dollars for the drink, he gets nothing to wear nor to eat—nothing that will help him earn more money. When the drink is gone, he has nothing good to show for it. It is a total loss to him. His money has gone to the rum-seller, who pays out half of it for more drink to sell, and keeps the other half to help him grow rich.

341. We will put it in this form^a:

<i>1st case—</i>	{	Shoemaker gets \$2.
	{	Customer gets one pair shoes.
<i>2d case—</i>	{	Saloon-keeper gets \$2.
	{	Customer gets one <i>headache</i> !

Here we see in each case two values. In the first both values are good, and the bargain is fair. In the second the headache is worthless—the customer is cheated. To say that his two dollars are lost is exactly what we would say in the other case if the shoes were worth nothing.

340. What does he get if he pays his two dollars for drink? What has he to show for it? Where has the money gone?

341. Put it on the board. Explain about the two values.

342. When we say that three hundred millions of dollars are lost every year, we mean that so much grain and fruit and labor are lost. We express the value in money. If sold they would have brought so much money; or, they cost so much money when the drink-maker bought them. The fruits and grains have stood and rotted till they are spoiled. They are worth nothing, because they can do no one any good.

343. The drinkers also lose more than the cost of the drink. They lose time in drinking and in being drunk, in sickness, and in laziness. The value of the time so lost is about equal to what they pay for the drink, or about six hundred millions of dollars every year. Try the experiment of figuring up the time lost by some men of your acquaintance in that way, with perhaps the time of teams waiting while they drink and are drunken, or business hindered in some other way.

344. This added to the three hundred millions of dollars makes nine hundred millions of dollars probably lost to this country every year. Now

342. Is the money itself lost? What is lost? What value do we express in money? Why are the fruits and grains now worth nothing?

343. What else do the drinkers lose? What is the value of the time lost? What experiment can you try?

344. For what do we add three hundred millions more? How much does that make in all?

add to this three hundred millions of dollars more as the cost of accidents, the trial and punishment of criminals, the shortening of human life, and many other things we have not room to mention, and it makes the sum of twelve hundred millions of dollars lost throughout the country every year on account of the drink.

345. Put it on the board thus:

First cost of the drink, - - - - -	\$300,000,000
Cost of time to the drinker, - - - - -	600,000,000
Cost of accidents, etc., - - - - -	300,000,000
	<hr/>
	\$1,200,000,000

346. We can not take into our minds any such vast amount. It is enough to make a rich country poor. It is certain if we waste that amount in drink, we can not have it to do anything else with. If we make the grain into drink, we can not have it to eat. If the man wastes his time in drink, he is not raising food nor earning clothing for himself and family, and they are all the poorer for it. If the money is used in building breweries and distilleries, it can not be used for

345. Put it on the board.

346. What can not we do? What can it do? What is certain? If the man wastes his time in drink, what follows? If the money is used in building breweries and distilleries, what follows?

building school-houses and clothing children and sending them to school, nor for any other good purpose.

347. Instead of doing good, it does harm. It goes down the throats of the drinkers to poison them, causing sorrow and disease and crime and poverty from one end of the land to the other. You and I help pay for it. It is not possible to lose so large a sum out of the country every year and we not feel it.

348. It comes to us in this way: Crime and poverty and accidents make the taxes higher, and that makes the rents higher and the cost of our homes greater to every one of us. Merchants and grocers and shop-keepers of all kinds having heavier taxes, charge us more for everything we buy.

349. Every new hat, book, or pair of shoes you have, costs more than it would but for the drink. Even if none of your friends drink, they must help pay this big drink-bill. It often makes them work very hard, and it prevents your hav-

347. What does it do to the drinkers? Who help pay for it? What is not possible?

348. How does this expense come to us through taxes? Through merchants and shop-keepers?

349. How does it affect your new hat or new book? How does it make your friends work? What does it prevent?

ing things as good, as nice and as often as you would have but for this vast amount of drinking.

350. The drinking-man suffers the most, besides making us all so much expense. In the first place, it costs him what he pays out for the drink. When he begins he thinks it little, but reckon up some of these littles and see what they amount to. If a young man at twenty-one drinks one glass of beer every day at five cents a glass, what will that amount to in one year? in two years?

351. We will suppose he next drinks two glasses a day, how much will that amount to for three years? How much will that be for the whole five years? If he drinks three glasses a day for the next four years, how much will that be? How much will that be for the whole nine years? How old will he be by that time? How much would it cost in a year for three glasses a day at five cents each? How many suits of new clothes would that buy for his little boys at \$10.95 each?

352. There are many families where the boys

350. Who suffers the most? What does it cost the drinker first? What does he think?

351. Give the answer to these problems.

352. What is said of many families? What does it often cost the drinker?

and girls never get any new suits from one end of the year to the other, because their father spends his money for drink. There are thousands and thousands of cases where it costs the drinker all his property, scatters his family, and brings him at last to the poor-house and a pauper's grave.

Review.—What is the first cost of alcoholic drinks? What is the annual drink-bill of this country? How much of it goes into the pockets of the rum-seller? Answer the plea that liquor-making gives employment to many people. What is really lost? Explain the two values in every fair bargain. Who gets cheated in the liquor-selling? What else does the drinker lose? What is the total annual loss to the country? Upon whom does this fall? Show how the drinker suffers most. Work out problems. What is often the result to the drinker and his family?

LESSON XXIX.

DISEASE FROM ALCOHOL.

353. A DISEASED state of the body is the first result of taking alcoholic drinks.^a Intoxication is the sign of serious disease.^b It shows that the brain is poisoned. The stomach soon becomes badly diseased. Dr. Richardson says that the digestive apparatus and the nervous system receive great harm from alcohol.^c

354. Alcohol not only hurts the liver, but through the bad blood which comes from the diseased liver, it invites and increases all other kinds of disease.^a Cholera is frequently brought on in this way in cholera seasons. In Park Hospital, New York, in 1832, out of two hundred and four cases only six were temperate persons. They all recovered, while one hundred and twenty-two of

Questions.—353. What is the first result of taking alcoholic drinks? What is the sign of serious disease? What does Dr. Richardson say?

354. What makes the blood bad? What comes from this? What is said of cholera? What happened in New York Hospital? In Tiflis? What is a common thing?

the others died. Mr. Huber says, "In Tiflis, Russia, every drunkard has fallen."^b It is a common thing for men to come down with cholera after a spree.

355. In yellow fever epidemics it is the filth from bad sewers, or from no sewers, that makes bad air, which takes hold of the drinkers first, because of the bad condition of their blood, about which we learned in Lesson XVII. Dr. Cartwright, of New Orleans, says that in one season in that city five thousand drinking men died with yellow fever before it touched a sober man.^a

356. If we look around almost anywhere we find people dying with familiar diseases which have been brought on by the poison of the drink. Dr. Richardson says, "As a cause of disease it (alcohol) gives origin to great populations of afflicted persons, many of whom suffer even to death without suspecting the cause."^a

357. He also gives the names of many of the diseases most frequently caused by the use of alcoholic liquors. Among these is consumption,

355. Why does yellow fever attack drinkers first? What does Dr. Cartwright say?

356. What shall we find almost anywhere? What does Dr. Richardson say?

357. What does he give? To whom does alcoholic consumption come? What do they think? What is said about a remedy for it?

which comes especially to men who call themselves moderate drinkers, men who drink much and often, but do not show it. They may never have been drunk in all their lives, and they think alcohol agrees with them. There is no remedy whatever for "alcoholic consumption."^a

358. The diseases that we have mentioned (excepting the last) are not always caused by using alcoholic liquors. Many invalids suffering from such diseases have never taken alcohol. It is only by learning the history of each case that the cause of the disease can be known.

359. A great variety of diseases come more or less frequently from the use of alcoholic liquors.^a Dr. Gordon, of London Hospital, says that they amount to seventy-five cases in one hundred.^b Professor Buchanan, of Glasgow Hospital, says that a large proportion of the accidents which they have to treat are more or less directly due to the effects of intoxication.^c

360. The condition of the blood of even moderate drinkers is so bad that surgeons very much dis-

358. Are these diseases always caused by alcohol? How can the cause of the disease be known?

359. What comes from the use of alcoholic liquors? What does Dr. Gordon say? What does Prof. Buchanan say?

360. Why do surgeons dislike to operate upon drinkers? What caused the death of a beer-drinker? What does Dr. Edwards say?

like to operate upon them. Often very slight wounds will not heal. One beer-drinker died from an operation on his finger, which was festered with a sliver.^a Dr. Edwards says, "These diseases are always of a dangerous character, and, in case of accident, they can never undergo even the most trifling operation with the security of the temperate. They almost invariably die under it."

361. The wounds do not heal because the blood is so bad. They fester and mortify, and prove fatal.^a Sores break out and spread and refuse to heal, such as the Geneva ulcer, sometimes found on gin-drinkers. It is also met with in the blotched, red-faced wine-bibber.^b

362. Look now at the condition of the habitual drinker of alcoholic drinks: his blood corrupt and his body bloated and festering with disease.^a See the purple and swollen face, and remember that these are only outward signs of the disease and corruption within.^b Have you seen anything like it elsewhere?^c Turn back to the beer vats and see the foul scum that covers the seething mass.^a Try again the experiments of fermenting apple

361. Why is this? What is said of sores? Where is the Geneva ulcer found?

362. Describe the condition of the drinker. What is his appearance? Where have you seen anything looking like it?

and grape juice, and you will see a surprising resemblance to these festering faces.

363. The cause is the same.^a Just as fermentation and decay were excited by adding some decaying substance (39), so the drinker of alcohol has filled his body with corruption and decay by continually taking this filthy poison.^b Alcohol is the essence of decay.

364. The living organism makes great efforts to throw it off, but continual pouring in has at last brought about this frightful result. If a man persistently takes into his body these decaying and poisonous substances he must expect to fester, decay, and die with them.

365. The malaria of unhealthy places comes from little germs of decaying animal or vegetable matters that we eat, drink, or breathe.^a Twenty-seven school children once died from drinking the waters of a brook in which lay the decaying body of a small animal.^b In all these fermented drinks there is decaying vegetable matter, and we find,

363. What is the cause? How are fermentation and decay excited? How has the drinker filled his body with corruption and decay? What is alcohol?

364. What does the living organism do? Why must the drinker expect to fester and decay?

365. From what does the malaria of unhealthy places come? What happened to school children? What is there in fermented drinks? What is no wonder?

from long observation, that this is not safe either to drink or to breathe. It is no wonder that the man who takes it continually shows signs of filthy decay and disease.

366. Let us see, on the other hand, what we may hope for if we do not drink. Sir Henry Monroe, of Hull, England, says that for seven years he had much experience in doctoring persons who were total abstainers. He found they did not suffer nearly so much sickness as moderate drinkers, and that, when sick, they were soon well again. In many cases they would have died if they had not been abstainers.^a

366. What may we see on the other hand? What does Sir Henry Monroe say?

Review.—What does taking alcohol produce? What organs are principally affected? What makes bad blood? What is said of cholera? Of yellow fever? What does Dr. Richardson say? Describe alcoholic consumption. What does Dr. Gordon say? What relations do alcoholic drinks bear to surgical operations? To sores? What relation does this festering condition of the body bear to the drink that causes it? Illustrate with cases of malaria. What does Sir Henry Monroe say of abstainers?

LESSON XXX.

DEATH FROM ALCOHOL.

367. A vast number of people are killed outright every year by taking alcoholic liquors. A vast number more are killed by them indirectly (356.)^a What was once said of the French army in Egypt is true everywhere, and with other diseases also, "Those who indulge in intemperate habits and are attacked by fevers, die. They are also more liable to be attacked."^b

368. The exact number of those who die in this country every year from these causes is not known. The common estimate is sixty thousand. It is difficult to find the true number, because in individual cases people do not always know the cause of the disease. The friends do not like

Questions.—367. How are a vast number of people killed every year? How are others killed indirectly? What was said of the French army in Egypt?

368. What is the exact number who die from these causes? What is the common estimate? Why is it difficult to find the true number?

to tell when they do know, and the physician does not like to expose the true state of things.^a They are all ashamed, and try to hide the truth.

369. There are many facts, however, which we can get at which help show the terrible risk run by those who take alcoholic drinks. There are certain business companies who agree for fixed rates to pay an insurance on a man's life; they pay money to the man's family when he dies. These are called Life Insurance Companies.

370. Of course it becomes their duty to know whether or not he is likely to kill himself by drinking; so they take great pains to find out what difference the drink makes in a man's chances of living, and their statements are well worthy of attention.

371. Some of these insurance companies insure temperance men by themselves, and do it more cheaply. When once asked the reason for this, an officer replied that it was only fair, because "those who do not drink do not die off so fast." If people would drink, he said he could not help their dying.^a

369. Explain how the figures and estimates of the Life Insurance Companies may help us.

370. What is it their duty to know? What do they take great pains to find out?

371. Why can they insure temperance men more cheaply?

372. A Mr. Neison, who has spent much time in studying the figures published by these Insurance Companies, says that when a person is twenty years old and not a drunkard, he has a good chance of living forty-four years longer. But if he is a drinker, he has a chance of living only fifteen and a half years longer. He also says that between the ages of twenty and thirty the drinker is five times more likely to die than the abstainer.^a

373. Dr. Homer O. Hitchcock, President of the Michigan State Board of Health, says that life is shortened to each drinker on an average fully twenty-eight per cent. Stated in another way, this means that if a drinker dies at fifty, he would probably have lived to be sixty-four if he had not drank.

374. A coroner of Preston, England, says he has kept a close account of this matter for twenty years, and that excepting those who met with accidents in the mines, nearly nine-tenths of the inquests he holds each year are on those whose deaths are in some way caused by drink.

372. What does Mr. Neison say? How much more likely to die is the drinker than the abstainer?

373. Who is Dr. Homer W. Hitchcock? What does he say? How much longer would the man of fifty have lived if he had not drank?

374. What does the coroner of Preston, England, say?

375. We found in Lessons XVII, XX, and XXIX, that brain, nerve, and liver diseases are very common among drinkers. We now learn that when drinkers have brain disease, they are three times as likely to die with it as temperate men. If they have liver disease they are four times as likely to die with it as the temperate.

376. In Great Britain the estimate of annual deaths has been about the same as here, or sixty thousand. But of late, new investigators claim that not less than one hundred and twenty thousand die directly or indirectly from this cause. Careful statistics show that rum-sellers and saloon-keepers die off more than twice as fast as clergymen and abstainers.^a

377. Some persons have such remarkable strength that they live to be very old, and yet die of disease. We can not reasonably point to them and say, "Those old people drink, and therefore drinking can not be very bad." Dr. Holyoke, of Salem, lived to be one hundred years old. He was

375. What lessons are here referred to? What did we learn in them? (Ref.) What do we now learn about those who have brain disease? Liver disease?

376. What has been the estimate of annual deaths in Great Britain? What do new investigators claim? What do careful statistics show?

377. What is said of some who have remarkable strength? Relate the case of Dr. Holyoke.

what was called in those days very temperate, taking but one glass a day, and that not very strong, and smoking his pipe. When examined after death, it was found that he died of cancer in the stomach, a disease frequently produced by tobacco and alcohol.^a

378. In 1878 there was a man living in the northern part of the State of New York healthy and vigorous at the age of one hundred and two years. He had never taken alcohol.^a We know that it kills people, and we have good reason to believe that the race would live far longer and be far happier without it. Dr. Kerr, of England, says the loss of human life from alcohol is something we might surely prevent; that it is quite without excuse.^b

379. An old tippler was once boasting about himself and how long he had drank, when some one asked after his drinking companions. "Ah," said he, "that is quite another matter. If the truth must be told, I have buried three entire generations of them." So this proves that if we would judge of the real effects of the drink, we must not be misled by a lone survivor here and

378. Give case of the man 102 years old. What do we know of alcohol? What does Dr. Kerr say?

379. How did the old tippler boast? What did he confess about his drinking companions? What does this prove?

there, but find out how many it has sent to their grave.

Review.—How many die of aleoholie drinking in this country ? Why is it diffieult to learn the truth ? Where can we find faets ? Why may the figures of Insurance Companies be relied on ? How do they favor temperance people ? Why ? What do they say ? What does Dr. Hitchcock say ? What does the Preston coroner say ? How much more liable are drinkers to die with brain diseases than temperate men ? With liver disease ? What is the estimate of deaths in Great Britain ? What is the difference in the death rate between saloon-keepers and temperate people ? Why do some attain remarkable age ? Give ease of Dr. Holyoke. Of the man in New York State. What have we good reason to believe ? What does Dr. Kerr say ? What did the old tippler say ? What does this prove ?

LESSON XXXI.

AN ARTIFICIAL APPETITE.

380. ANY one who begins to use alcoholic drinks is very likely to take more and more. The beginner never expects to become a drunkard. He says with much self-confidence that he knows when he has enough and when to stop. All drunkards have said the same thing, but long before they suspected it others were calling them drunkards. The drinker may stop when he *feels* that he has enough, but it takes more and more to produce that feeling, and he does not believe that.

381. Men do not so crave natural foods and drinks.^a The same amount of bread, beef, potatoes, and fruits that satisfies a man for his dinner to-day, will be likely to satisfy him next year, or

Questions.—380. What is one who begins likely to do? What does the beginner never expect? What does he say? What follows? What does he not believe?

381. What do not men crave? What is said of bread, beef, milk, water, etc.?

in five years from this time. The same amount of milk and water that satisfy him now will satisfy him then.

382. This is rarely the case with alcoholic drinks. To understand this, remember that men do not take these drinks because they do them any real good. They may like the taste of wine or cider, or they may take them because they are asked to take them. But they soon begin to like the peculiar feelings caused by the alcohol, and they feel uneasy if they can not get a drink, and then they must continue taking more and more to bring about the same degree of feeling.^a

383. Here is the danger: the poison creating such a craving in the drinker that he longs to be poisoned again.^a It is not so with most other poisons. A boy swollen up with poison ivy or nettles, or one who has taken lobelia or deadly nightshade, is very careful to avoid those poisonous plants ever after. To see him poison himself again and again until he became a mass of rottenness and corruption would be strange indeed, but that is exactly what happens to thousands of men who take alcoholic poison.

382. Is this the case with alcoholic drinks? What must we remember? What do they begin to like?

383. What is the danger? Is it so with other poisons? Give illustrations.

384. This terrible fascination is known as the drunkard's artificial appetite. This craving makes it exceedingly difficult for him to stop drinking. We who have never felt it scarcely know how to pity the poor victim^a whose hand, contrary to his best intentions,^b goes out after the poison that is killing him, this brain-poison that has broken down all his strength of will.^c

385. When he began to drink he used to say laughingly, that he could drink or he could let it alone. He says this no longer. He would be glad to stop if he could, but he thinks the effort would kill him. There are supposed to be over two hundred thousand such drunkards now in this country.^a A very few, alone, or by the help of others, have with great effort reformed, but the larger number by far have gone on to the drunkard's death in spite of all efforts.

386. This appetite is in most cases easily start-

384. What is the name of this terrible fascination ? What makes it difficult to stop drinking ? For what is the poor victim to be pitied ?

385. What did he say when he began to drink ? What would he now be glad to do ? Why does he not stop ? How many such men are there supposed to be in this country ? How many have reformed ?

386. What is said of starting this appetite ? In what cases is this appetite often inherited ? What is it likely to do ? Does this trouble any one before they drink ? In what is the only safety ?

ed. Its seeds are sown with the first drinks and it grows either slowly or rapidly, but surely. Where parents or grandparents were drinkers, this appetite is often inherited,^a and is likely to spring up suddenly with the first glass.^b It is believed that this inherited appetite does not trouble any one before he drinks.^c The only safety lies in not touching the poison.

387. A *natural* appetite is the desire for and the relish of necessary food which it helps us enjoy and digest. Temperance is the proper control of our appetites. It enjoins a moderate use of good things and total abstinence from poisons. True Temperance entirely prevents forming an artificial appetite.

388. Intemperance is self-indulgence. It is wrong-doing. It is a vice and not a disease, though it produces many diseases. One of the worst of these diseases is this terrible artificial appetite.^a To cure this or to take it away, has caused much study. A far more important study for us is to prevent its formation.

387. What is a natural appetite? What is Temperance? What does it enjoin? What does true Temperance prevent?

388. What is Intemperance? Is it a vice? Is it a disease? What does it produce? What is one of the worst of these diseases? What has caused much study? What is a more important study for us?

389. It is well to know what will cure disease, but it is much better to know what will prevent it. The best rule is very simple, very effective, very brief: NEVER BEGIN TO DRINK! If you have begun, take no more. This is the only sure preventive of the drunkard's Artificial Appetite.

389. What is it well to know? What is better? What is the best rule?

Review.—What is this artificial appetite? How is it formed? How does it differ from the desire for natural foods and drinks? How does alcohol differ in this respect from other poisons? What is the difference between the drinker in his early and in his later days? How many such drunkards are there in this country? What proportion of them reform? How is this appetite started? What is a natural appetite? What is Temperance? What is Intemperance? What does it induce? Which is the more important of these studies to us? What is the rule of prevention in this case?

LESSON XXXII.

WHAT SHALL I DO ABOUT IT?

390. What you have learned in these lessons ought to secure you against being poisoned by alcohol. Surely boys and girls who have been taught its nature and doings will not seek it out and poison themselves with it. But that is not enough, for it will come to you. Some playmate may offer you a glass of beer, or the grocer may tempt you when you are doing an errand. A pet cousin may bring it to you in a glass of cider, or it may come by grandmother's dear hands when you are spending Thanksgiving at the old home-stead.

391. You may get the taste from the wine jelly, the pudding sauce, or the mince pie at the table, and that will make it easier for you to take a glass

Questions.—390. What ought these lessons to do for you? What will boys and girls not do? Why is not that enough? How may it come?

391. How may you get the taste? If you escape all these how may it come?

whenever that is offered. If you escape all these, it may come in the New Year's call, at the wedding party, in the hay-field, at a raising, or at a public dinner. If you hesitate, you will be told, "It will not hurt you," or it is "nice home-made wine, and has no alcohol in it," for very few people know how alcohol is made.

392. What will you do about it? I know a little boy who says, "It will not hurt me if I do not take it," or, "Water will do for me," and he sticks to his principles. No persuasion can move him. He is good-natured about it, and people soon stop tempting him. It is not pleasant to be laughed at, but it will not hurt if you laugh with them. Say, "Let him laugh who wins," or, "My time to laugh will come yet." Many other answers might be given. If you are often tempted, you will need to be ready with replies.

393. Boarding-school and college students meet with temptations in the rooms of their school-mates, in club-rooms, in cosy places fitted up for them by the rum-seller, and perhaps even at commencement dinners. You must learn to be brave, and say "no," for there is no one whom alcohol

392. What answers does the little boy make? What is the result? When does it not hurt to be laughed at?

393. Where do students meet with temptations? Why should you be brave and say "no"?

hurts more than the student. Keep your brain clear, whatever else happens.

394. During summer vacations, on pleasure trips, and when traveling, you will be specially tempted. A great many Americans traveling abroad leave their temperance ideas at home. You will find plenty of wine on shipboard, perhaps an old schoolmate who keeps a wine-closet in London, and you will be told everywhere that you must drink wine or beer, because the water is so bad.

395. The best reply to this is always to try the right thing. Alcohol is the same all the world over, it will not pay to try that. Many of the arguments and proofs against it in these lessons are taken from European books and doctors, the very highest scientific authorities known. Careful, intelligent, and observing men have tried doing without all sorts of alcoholic drinks in traveling, and have found it to their advantage.

396. Dr. Holland, also known as Timothy Tit-

394. How will you be tempted during vacations? What is said of Americans traveling abroad? Where will you be likely to find wine? What will you be told?

395. What is always the best reply? Why will it not pay to try alcohol? Whence have our arguments and proofs been taken? What have careful and intelligent men tried?

396. What does Dr. Holland say? What did he do? What one member of his party did the best?

comb, after traveling in Europe, says, "I was told that I could not get through Great Britain safely without drinking beer. Well, I did not drink beer, and I got through Great Britain very comfortably indeed on cold water. In Paris and Switzerland I took the ordinary red wine till I was satisfied that every glass damaged not only my health, but my comfort. That member of my party who has drunk nothing but water from the time of leaving America has experienced not one particle of inconvenience from the practice."

397. If you meet with political men, club men, commercial men, or sporting men, drink may be offered, and you must learn to say no. If you try your hand at marksmanship and win a prize, as Angus Cameron did, you too might get the offer of the claret cup. Could you bravely say no, and go without, as he did?

398. It is well to know what the customs are, so that we may be ready to meet them and to hold our own.^a At a public dinner where wine is served, you can turn your glasses upside-down. It is quite easy at our American dinners for anyone to refuse wine. If you ask to be excused your request will be granted usually at once.

397. Among what kind of men may drink be offered? What must you learn to say?

398. What is it well to know? What can you do at a public dinner? What is quite easy?

399. General Washington set a good example in that respect, for though almost every one drank wine in those days, he graciously excused a young officer who declined to drink, saying that he honored him for his frankness and consistency in adhering to a rule which could never do harm. Even Queen Victoria says there is no compulsion at her table^a

400. In this country we are gaining a step by having public dinners without wine. Mrs. Hayes, at the White House, has started a new movement by having no wine at State dinners. Some wives of the European Ambassadors have expressed their delight with the air of purity it gives to her entertainments.

401. Many years ago it was the custom in New England colleges to have wine at the dinner of the graduating class, and the bill for it was paid by the student who stood first as the valedictorian. Now it is becoming the custom to have no wine at such dinners. At the class-day dinner,

399. What good example did General Washington set? What did he say? What does Queen Victoria say?

400. What step are we gaining in this country? What new movement has Mrs. Hayes started? What remarks have been made about it?

401. What was the custom many years ago? What is now becoming the custom? What happened at Harvard College? What is said of some other colleges?

and at the dinner for the elder graduates (the alumni) in Harvard College this year (1880) there was no wine on the table.^a There are some colleges where they have never had wine at their dinners.

402. In some of the stories you read, and in books of poetry, you will find many signs of the drinking customs. Robinson Crusoe carried rum ashore from the wreck, and kept it among his treasures for occasional use. The Swiss Family Robinson had home-made wine among their luxuries in their new home. Some of our best poets sing the praises of wine. Burns' poetry, the delight of many a school-boy's heart, is sadly marred by signs of the drink. The whole world has been deceived by alcohol, the poets among the number, but that has not prevented their falling victims to it.

403. Burns drank himself to death at the age of thirty-five, being carried off with a fever taken from lying out all night in a drunken fit.^a The poet Cowley died from a similar cause.^b Shakespeare, Byron, Goldsmith, Lamb, the great Swift,

402. What will you find in stories and books of poetry? What in Robinson Crusoe? What did the Swiss Family Robinson have? What is said of Burns' poetry? Who have been deceived?

403. What caused the death of Burns? What other poets were hurried off by drink?

our own Edgar A. Poe,^c and many others, have been hurried off by the drink,^a and their sad examples should be sure warnings to us.

404. No matter how good nor how wise people may be, that will not prevent the alcohol from poisoning them if they take it. They will be deceived by it, as others have been, and the excuse of their taking it will not prevent its hurting us if we take it. There are many people in the world who have never yet learned how deceitful and hurtful alcohol is. Be thankful that you have learned, and act up to the best of your new-found knowledge.

404. What will not prevent alcohol from hurting people ? What will not prevent its hurting us ? What have many people not yet learned ? For what should you be thankful ?

Review.—What should make you safe against alcohol ? Mention some of the ways in which you may be tempted. Mention some of the answers that may be made. How are students tempted ? Why should they bravely say "no" ? What temptations come in traveling abroad ? What is the best reply ? What is said of many of the best arguments and proofs in these lessons ? What does Dr. Holland say ? Which one of his party did the best ? Among what kinds of men may you be tempted ? What is said of General Washington ? Of Queen Victoria ? Of Mrs. Hayes ? Of college dinners ? What will you find in stories ? In books of poetry ? Mention some of the poets who shortened their lives by drink. Why is their drinking no excuse for us ? For what should we be thankful ?

LESSON XXXIII.

WINE, CIDER, AND BEER.

405. AFTER all we have learned about alcoholic drinks, none of you will think that these three—wine, cider, and beer—are harmless.^a They each contain alcohol, and that does mischief in whatever shape it is taken. With these drinks most people begin to drink and form the appetite, and then to satisfy that they require stronger drinks.

406. In Switzerland, where everybody drinks wine, and where the people make it from their own vineyards,^a they are now drinking twenty-five times as much brandy as they were sixty years ago.^b In California they make and drink their own wine and brandy, and get drunk on them. Dr. Patterson says, “Go into the regions

Questions.—405. Why should we not think wine, beer, and cider harmless? What do they all contain? What is formed by the use of these drinks?

406. Show that wine-drinking has led to brandy-drinking in Switzerland. What do people do in California? What does Dr. Patterson say?

where wine is made and you will find twenty times as many drunken men as you will in San Francisco. Women are having delirium tremens, and some drunkard is dying out of almost every family that is in the wine-making business."^c

407. This same fatal California wine is carried to all other parts of the country with the saddest results. Sometimes it is put up in tiny bottles for the children; in this way many of them get their first drink, and learn to love the poison which will be likely to ruin their lives. Home-made wines are equally hurtful whatever fruit they are made from. If they are fermented, the fruity part is all rotted out, leaving the poison, alcohol, behind.^a Those who make it seldom know this fact, unless they have studied about it, as you have in these lessons.

408. Very many people think that it is only adulterated wines that do mischief, but it was pure wines that were used in these cases in Switzerland and California. Most of the drinking and drunkenness we read of in ancient history was on pure grape wines.

407. Where else does this California wine go? How is it put up for children? What will it do to them? What is said of home-made wines? What is said of those who make them?

408. What idea have many people? Where do they have wines made of pure grape juice? What is said of ancient drunkenness?

409. There is the same objection to cider. It is made from apple juice, just as wine is made from grape juice. It contains the same alcohol, its use creates the same appetite, it makes people drunk, and it makes drunkards. All this has been done with simple cider. When cider is made and kept at home, some member of the family is often stupidly, boozily drunk for days or weeks together.

410. Sometimes, like other alcoholic drinks, it makes the drinkers cross or violent. A carpenter, drunk on cider, was once known to chase another man around the new building on which they were at work, trying to kill him. A man in Northern New York, drunk on cider, shot an innocent neighbor who was looking out the window.

411. It has been known to produce delirium tremens, as it did with a boy only six years old in Masonville, N. Y., who was allowed to drink all the cider he wanted.^a A more recent case occurred in Massachusetts, where a family of four persons

409. To what else is there the same objection? How is it made? What does it do? What often happens in families where they make and keep cider?

410. How does it affect them? What did the carpenter do? What occurred in Northern New York?

411. What has it been known to produce? Give case of the boy. Of the family.

drank between forty and fifty barrels of cider in less than a year. By summer, when the alcohol was well formed, two of them had died and the others had delirium.^b

412. Dr. S. I. Prime says, in speaking of New Hampshire, "Cider is made and drunk largely, and it is a bad liquor to get drunk on. Beer stupefies, and cider sours a man; the cider drunkard is the ugliest man to meet."^a In this way cider causes much unhappiness in families. Many a mother has been very sorry because she allowed her sons to drink cider. Six sons in one family in Connecticut, who began with cider, became drunkards.

413. Families usually begin with what they call sweet cider, and go on drinking it every day, the alcohol coming so slowly, so little at a time, that they do not know it. The chemist, Dr. Hayes, of Massachusetts, says that he finds alcohol in cider made from sound apples, before it is twenty-four hours old. If some of the apples are decayed, the alcohol comes sooner. A reformed man said,^a "I would not dare drink sweet cider;" and another said, "If you have any regard for us do not

412. What does Dr. Prime say? What does cider cause? What is said of mothers? Give case of the six sons.

413. What do families usually do? What does Dr. Hayes say? What do reformed men say? How can you avoid all risk?

set the example of drinking even sweet cider." If you do not touch it you will run no risk of getting any alcohol from it.^b

414. Beer is also dangerous just in proportion to the alcohol it contains. There is no beer without alcohol. It is a degrading and a filthy drink at best,^a because made of the decayed washings of grain. Alcoholic drinks are always filthy, but beer has more decayed matter than some other drinks, often producing a bloated and diseased state of the body.

415. In England a great number of drunkards take nothing but beer, of one kind or another, for they have many kinds there, and some of them contain much alcohol. Porter, stout, ale, and table-beer are different kinds of beer made from grain. These different kinds are also sold in this country, but not so largely as lager-beer, introduced by the Germans. The latter contains three or four per cent. of alcohol.

416. In places where beer is prohibited, efforts

414. How is beer dangerous? What kind of a drink is it? Why? What does it produce?

415. What takes place in England? What have they there? Where else are these sold? What do we use more largely? What does it contain?

416. What is sold in place of beer? How can we tell what drinks have alcohol? Name some not usually thought to have alcohol. What is a safe way? What is a still better way? What can you take safely?

are made to sell "hop lager,"^a or "hop bitters," or some other bitters, but they all have alcohol, and that is the reason why they are used. All kinds of sweet drinks that stand and ferment have alcohol. Even "spring beer," "root beer," "ginger beer," and other drinks not usually suspected, may have alcohol. A safe way is to find out if they have stood and fermented. A still better way is never to touch any of these drinks. Take water, clear and pure, and you will be in no danger.

Review.—What have we learned about wine, cider, and beer? Give the results of drinking "pure" wine in Switzerland. In California. What else is done with California wines? What is said of home-made wines? What is said of the effects of pure grape wines? What proof from history is given? How is cider made? What will it do? Give cases. Give cases of delirium tremens produced by cider. What does Dr. Prime say? What is said of mothers? Of sons? How do people usually begin? How soon does alcohol appear? What harm does this small amount do? How dangerous is beer? Why is it filthy? What is largely drank in England? Here? What is said of other drinks? What is the best way?

LESSON XXXIV.

ACHIEVEMENTS OF ABSTAINERS.

417. WE have many proofs in this book and elsewhere, that men who give up the use of alcoholic drinks do far better without them. There is another truth which we have hardly yet begun to learn. Those who *have never drank* can do still better; while those whose parents and grandparents never drank, are by far the most successful. We have little idea yet what people will be able to do when they are quite rid of the effects of alcoholic liquors; but we will now learn what some life-long abstainers have done.

418. When Europeans first came to this country, it was not uncommon to find Indians over 100 years old, who endured great hardships in war and hunting. Brandy, rum, wine, beer, and other

Questions.—417. Of what have we had many proofs? What truth is there yet to learn?

418. What is said of the American Indians before they used alcoholic liquors? Since they used them?

alcoholic drinks were quite unknown to them. Now that they drink alcoholic liquors, they do not live longer than Europeans.^a

419. The inhabitants of India do not use alcoholic drinks^a except as they learn the custom from Europeans. We do not know how long they have been abstainers, but they are remarkable for strength, agility, and steadiness of nerve. They climb heights and walk scaffoldings with perfect ease, where Europeans are very dizzy. A band of men from the Himalayas who were in Calcutta, proved to be of great strength, each one nearly equal to three Europeans. They could grasp a man and hold him in the air as if he were a child.

420. It is very pleasing to follow the history of boys who were always total abstainers. One of these, about whom we have already learned, Benjamin Franklin (Lesson XV), became an illustrious man in American history. He worked his own way up in life as a printer, editor, philosopher, and statesman. He was one of the five

419. What is said of the inhabitants of India? For what are they remarkable? Give an illustration. Describe the band of Himalayans. What could they do?

420. Give the early history of Franklin. What did he do that made him illustrious? What did we learn about his total abstaining habits? (Lesson XV.)

men who drew up the Declaration of American Independence, and he was several years in Europe as our representative in the English and the French Courts.^a

421. Horace Greeley was another printer and philosopher who was a life-long abstainer. As a lad of ten, in the State of Vermont, he did not know another boy nor man in all the neighborhood that did not drink. He worked his way up till he established a great daily paper in the city of New York. His diet was always simple, and he persevered in his total abstaining as long as he lived.

422. Sir John Ross, the great Arctic explorer, was also a life-long abstainer. While he was an "apprentice" he made three voyages to the West Indies, and three to the Baltic, during which he saw how much harm liquor can do in both cold and hot climates. In one of the voyages to Jamaica, the captain and several of the crew died, and in another all the crew died.

423. He was never sick, yet he took no special

421. Who was Horace Greeley? What is said of his boyhood? What did he establish? What is said of his diet and abstinence?

422. Mention another life-long abstainer. Where did he go in early life? What did he learn?

423. What care did he take of himself? How was he exposed? What proof of hardihood did he give in old age?

care of himself except that he would not drink liquor. He exposed himself to sun and dew, ate fruit, slept on deck, ran around barefooted and bareheaded, and felt safe so long as he did not poison himself with alcohol. As we have seen (Lesson XIX), when he was an old man, twenty years older than any of his crew, he endured all the rigors of an Arctic winter better than any other man in the company, because he did not touch the tobacco and spirits which they all used.^a

424. Rev. Dr. Scoresby, who went to sea at the age of ten, and at twenty-one had command of a ship, was both a whaler and an Arctic explorer. He too detested alcoholic liquors for the mischief they did. He says that the men who drank were the first to skulk duty, and when needed they would generally be found in some corner asleep. His career of early adventure and discovery was crowned by a life of devoted labor in the ministry.^a

425. Total abstinence for brain-workers had a good example in John Wesley. He claimed that

424. What did Rev. Dr. Scoresby do in his early days? What did he think of alcoholic liquors? What did he say of the men who drink?

425. Give an example of total abstaining for brain-workers. What were his habits in childhood? When he grew up? What did he recommend? What did he write at eighty-three?

his spare pure diet in childhood did him much good ; when he grew up, he chose to eat sparingly, and drink water, and he always recommended and enjoined temperance on others. When he was eighty-three, he wrote : " I am never tired, either with writing, preaching, or traveling." He was a busy man and a prodigious brain-worker.^a

426. Dr. Edward Hitchcock, of Amherst College, Mass., the noted geologist, was also a life-long abstainer. He made a geological survey of the State of Massachusetts, during which he rode five thousand miles in an open wagon, climbed inmountains, broke, trimmed, and transported more than five thousand specimens of rocks and minerals. He was constantly busy from sunrise until ten o'clock at night, yet he never took a drop of alcoholic drinks.^a

427. Thomas Edwards, of Banff, Scotland, is a shoemaker, and a great naturalist. He works at his trade through the day and hunts insects, birds, and other creatures at night and in the early morning. He is a wonderful self-taught student. A great point with him is sobriety.

426. Who was Dr. Edward Hitchcock ? What did he do ?

427. Who is Thomas Edwards ? What does he do ? What is a great point with him ? What advice has he disregarded ? What is his fare ? What does he say ?

His friends often advised him to take a little whisky with him when he went out on wet, cold nights, but he never did. He took only plain oatmeal cakes and drank only water from the brook. He says if he had drank whisky he could never have endured the wet, cold, and privations to which he has been exposed.^a

428. Adam Ayles, who went with a late English Arctic exploring expedition, has the honor of going nearer to the North Pole than any other man so far as we know. He was the champion of the ship in sledging, that hardest of all work, going out on long expeditions and dragging all the supplies on a sledge. He was out 110 days at this work, twelve days longer than any other man.

429. All the rest of the crew but one suffered with scurvy, and this other one, Aldrich, was almost a total abstainer. Ayles neither drank nor smoked. When seven of them were once out on a sledging party, five were struck down with scurvy, so that he and Aldrich had to draw them

428. Who is Adam Ayles (pronounced "Iles")? What honor had he? How many days did he sledge?

429. What disease did he escape? What was he urged to do? What reply did he make? What was the result? What is his boast?

on the sledge. Aldrich urged him to drink or they would all be lost. "No," said Ayles, bravely, "I promised my mother when a boy that I would never touch it, and if I perish in this ice, I will keep my word." He did not perish; he lived to return to England, where he was greatly honored, especially by his fellow Good Templars. His parents are total abstainers, and he boasts of never having a drop of alcohol in his body.^a

430. We have good reason to believe that we, every one of us, will be vastly better off without alcoholic liquors than with them, and we have reason to hope that all the world will grow better and better without them. Inspired by these high hopes and with so many incentives to self-denial, let us dedicate ourselves to lives of personal purity. With the words of Dr. Richardson, to whom we already owe so much, we close this book: "We therefore who live to reform the present age in this respect are stretching forth our powers to the next; to purify it, to beautify it, and to lead it toward that millennial happiness and blessedness which in the fullness of time shall visit even the

430. What have we reason to believe? What have we reason to hope? What does Dr. Richardson say?

earth, making it under an increasing light of knowledge, a garden of human delight, a Paradise regained.”^a

Review.—What comparison is made between temporary and prolonged abstinence? What change has drinking made in the longevity of the American Indians? What proofs are given of steadiness of nerve among the Hindoos? Of strength among the Himalayans? Give the history, success, and results of total abstinence of Franklin. Of Horace Greeley. Of Sir John Ross. Of Dr. Scoresby. What does he say of drinking sailors? Describe the abstinence and the labors of John Wesley. Of Dr. Edward Hitchcock. Of Thomas Edwards. Of Adam Ayles. Describe his faithfulness. How was it honored? What have we reason to believe? What to hope? Give closing quotation from Dr. Richardson.

TEACHER'S APPENDIX.

THE following Appendix contains the references from the small italics in the body of the work. Its object is to bring evidence from many sources to prove the truth of important statements. To save space, where books are easily accessible, like "The Temperance Lesson Book," or Story's work on "Alcohol," which every teacher ought to possess, only a reference is usually given to the place in such work where the proof is to be found. Most of these works which are readily accessible are mentioned in the advertising pages. As this science is new to the schools, not heretofore included in the teacher's early studies nor introduced in the Normal Schools, the teacher will find a gratifying novelty and freshness not usual in the text-books in common use. He will also feel a greater need of some investigation and collateral helps, and these he will find especially in the "Temperance Lesson Book," by Dr. Richardson, and in "Alcohol and Its Effects," by Dr. Story; and if he wishes a general book of reference on the subject, "Reid's Temperance Cyclopediæ." For more abundant illustrations and hints for experiments, black-board lessons and other suggestions, the "Juvenile Temperance Manual," by the same author as "Alcohol and Hygiene," is recommended. Since the paper edition of

that work is only 25 cents, all teachers can readily avail themselves of its aid.

Permit us to suggest that the scholars be encouraged to try the experiments in the text for themselves; and to induce expertness and efficiency, those who excel in that line might be permitted to display more or less of the experiments in recitation. It is also an excellent help to continually call the attention of the class to object lessons in the line of their studies. They should be led to make *discriminating* observations on such of the results of taking alcoholic liquors as come within their notice. The entire object of this study is practical, and it should be taught in such a manner as to produce practical results.

Wishing you, as teachers, abundant pleasure and interest in the pursuit of this eminently practical subject, the author, herself a teacher for many years, sends you a cordial good speed, and hopes you may have the supreme satisfaction of feeling that you have added an important element of safety and success to the equipment of your scholars for practical life.

J. C.

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TEACHER'S APPENDIX.

REFERENCES.

NOTE.—Some of the works that occur frequently have their titles abbreviated, as "The Cantor Lectures on Alcohol," by Dr. Richardson —"Cantor Lectures;" "Temperance Lesson Book" drops the first word; "Alcohol and its Effects," by Dr. Story, becomes Story's "Alcohol," etc., etc.

LESSON I.

2a. See Webster's definition, also "Chambers' Cyclopaedia," art. Alcohol.

5a. Where the hand of man interferes not, alcohol is never formed.—Joseph Spence, Chemist. See Lees' "Text-book," pp. 37-40. See also "Lesson Book," pp. 41 and 42.

7a. All substances containing either sugar or starch or both, will yield spirits.—"Chambers' Cyclopaedia," art. Distillation.

9a. Alcohol is always the product of decay. Obtain it from whatever source you may, the death of the vegetable must precede its formation and extraction. Vitality can not co-exist with it.—Dr. Charles Jewett in "Thayer's Life of Dr. Jewett," p. 395.

Infinite varieties of mould abound in the atmosphere of breweries. Common mildew is found in great quantities on wort and yeast that have been exposed to the air, also on malt before and after drying.—*Western Brewer* for Aug. 15, 1880, p. 821.

10a. All alcohol, whatever apparent form it assumes, has one origin. It comes from the destruction of sugar, and has no other source in nature. Youmans' "Alcohol," quoted in Reid's "Cyclopaedia," p. 21. See also "Chambers' Cyclopaedia," art. Alcohol.

LESSON II.

12a. The vinous fermentation in the juice of the apple and other fruits, in an infusion of malt or in the syrup of the sugar-cane, always results in the conversion of the sugar into alcohol and carbonic acid gas.—“Cider Maker’s Manual,” p. 72.

13a. It is a curious fact that in order to form alcohol the temperature of the decaying liquid must be between 60° and 80° Fah., or some put it as low as 45°. Below this it moulds and decays slowly; above 80° it runs at once into acetic acid. Thus narrow is the door which natural law permits man to open in order to let alcohol into being.

14a. In a day or sometimes less, the pomace will rise to the top, and in a short time grow very thick.—M’Kenzie’s “Useful and Domestic Arts.”

15a. Forty-five parts of the sugar are changed into twenty-two parts carbonic acid gas and twenty-three parts alcohol.—“The Worship of Bacchus a Great Delusion,” p. 16.

19a. Fermentation is nothing else but the putrefaction of a substance containing no nitrogen. It is excited by the contact of all bodies, the elements of which are in a state of active decomposition. . . . It continues till the original compounds are wholly destroyed.—“Turner’s Chemistry.” See also note to Chapter II, and page 22 in “Juvenile Temperance Manual.”

20a. The ordinary mode of collecting and mashing apples of all sorts, rotten and sound, sweet and sour, dirty and clean, from the tree and the soil, is the slovenly process usually employed.—M’Kenzie.

LESSON III.

25a. In fermentation the juice of grapes is changed from being sweet and full of sugar into a vinous liquor which no longer contains any sugar.—“Cantor Lectures,” p. 44.

26a. Alcohol is a purely artificial product, obtained only by carefully carried out chemical methods. It exists nowhere in nature.—Dr. Niel Carmichael in *Medical Temperance Journal*, April, 1880, p. 125. Also “Lesson Book,” p. 89.

28a. A *bona fide* wine derived from the fermentation of the grape only, can not contain more than seventeen per cent. alcohol.—Richardson's "Cantor Lectures," p. 124.

29a. An American importer tried to get some pure fermented wine from Spain unmixed with alcohol, but the reply came, "Had we not made this addition it would have spoiled before reaching you."—Delevan's "Essays," p. 89.

30a. See Richardson's "Dialogues on Drink," pp. 48-60.

31a. The practices of wine fabricators several years since underwent a thorough examination in the British Parliament and great numbers were convicted. In this book (Delevan's "Essays and Lectures," p. 91) will be found a great array of facts about the adulteration of wine, sustained by abundant testimony.

31b. Large quantities of fictitious wines are palmed off for genuine.—Almost all descriptions of wines are adulterated or imitated—the use of which, and of strong brandied wines, deprives the community of judging, by making impure wines the standard of general taste.—McMullin's "Handbook of Wines," pp. 170-172. (An American work).

32a. If all the liquor sold under various names—wine, brandy, gin, rum, whisky, ale, stout, sherry, cider—were divested of their alcoholic spirits, they would contain comparatively little of anything that would affect those who partook of them.—Richardson's "Cantor Lectures," p. 121. Also "Lesson Book," pp. 37, 39, 82.

LESSON IV.

41a. An experiment just here might be made quite useful to show that the gas is heavier than air, and also to show its suffocating nature. Pin a very short piece of candle to a cardboard and light it. Turn a tumbler over it, and let it burn till it is extinguished. Then turn it up with cardboard over it, and let it cool. Prepare another tumbler with a bit of lighted candle in the bottom, and then pour the carbonic acid gas from the first tumbler into it and extinguish the light.

41b. In breweries, even of the usual construction, there are on record several awful instances of its deadly effects upon brewers' laborers and others who have imprudently ventured into

vats without ascertaining whether they were quite clear of that noxious gas.—“The Worship of Bacchus a Great Delusion,” p. 19.

43a. D. Booth, in his “Art of Brewing,” a handbook for the use of brewers, says, in speaking of ingredients, “Hops are astringent and narcotic; broom and some others are diuretics; while many, as opium, *cocculus indicus*, *ignatia amara*, tobacco, and *nux vomica*, are highly poisonous. Yet each of these here mentioned, and others which we have not named, have been boiled among the worts of beer, without regard to their effects on particular constitutions, or to the general safety of the individuals for whom the liquor is brewed.” “*Cocculus indicus*, on account of its *very general use*, claims the first place on this list.”

Makers, vendors, and connoisseurs are themselves all at sixes and sevens as to when even the varieties in common use can be got to answer honestly to their names.—Guthrie’s “Temp. Physiology,” p. 144. See also the famous “Beer Trial” in Delevan’s “Essays,” pp. 102-128.

43b. No possible drugs nor adulterations can be so bad as this essential and characteristic element (alcohol).—Lees’ “Text-Book,” page 91. See also Richardson’s “Cantor Lectures,” p. 127.

We have a great horror of arsenic and fifty other things. The fact is that all these things are a mere bagatelle in relation to the most direct, absolute, immediate, and certain poisonings which are caused by alcohol.—Edmunds’ “Medical Use of Alcohol,” p. 21. See also Pereira’s “Materia Medica,” page 202.

44a. “Lesson Book,” p. 92.

44b. See Story’s “Alcohol,” pp. 65-69.

LESSON V.

49a. The carbonic acid gas is prevented from escaping by the tenacity of the dough, which, becoming distended with gas, swells up, forming a spongy mass. In this way are produced the vesicles, or eyes, which give to ordinary loaf bread its well-known lightness and elasticity.—“Bacchus Dethroned,” p. 93.

50a. Pereira in his "Food and Dict," in a note under the head of "Wheat" (Part I., Chapter III., Section 2), tells of a Mr. Hicks who patented a process in London to collect the alcohol from the ovens in which bread was baked.

50b. The alcohol was the product of the fermentation of a small portion of the sugar originally in the grain. None of the alcohol remains fixed in the bread.—"Regimen and Longevity," by Dr. John Bell, p. 133.

Well-baked bread does not contain any alcohol.—"Bacchus Dethroned," p. 93.

52a. If the vinous fermentation be not checked in due time by baking, the dough becomes sour, owing probably to the formation of both acetic and lactic acids.—*Ibid.*

52b. If boiling hot water should be turned upon the mash so that it would thicken up the starch not already turned into sugar, it could not be made into beer. It would make a kind of pudding or mush that the brewer could not use, and he would lose the whole of it. This sometimes happens. The liquor is then made nutritious instead of intoxicating, and that spoils it for the brewer.—"The Worship of Bacchus a Delusion," p. 10.

53a. The yeast, or leaven (old dough already in a state of fermentation), causes the sugar of the flour to undergo the vinous fermentation by which carbonic acid gas and alcohol are formed.—*Ibid.*

LESSON VI.

58a. It was long a matter of contest whether alcohol exists ready formed in fermented liquors, or is produced in the process of distillation. The chemists are now generally satisfied that it is produced by the fermentation alone.—"Art of Brewing," by D. Booth.

59a. Arnoldus de Villa, or Villanova, a physician of the south of Europe, who flourished in the XIIIth century, is the first writer who distinctly alludes to the discovery of ardent spirits. It was believed to be the universal panacea, which had so long been the object of philosophical investigation. Lully, of the XIVth century, believed it to be "an emanation from divinity for

the physical renovation of mankind." In the XVIth century it was used as a medicine only, and was known under the name of *aqua vita*, or water of life, from its supposed property of prolonging human existence.—"Bacchus," pp. 215, 216.

60a. For definition, use, and origin of the word, distillation, see "Lesson Book," Lesson 14.

61a. Water boils at 212° Fahrenheit, and alcohol boils at 173°.—"Lesson Book," p. 78.

63a. See "Temperance School," page 33.

66a. You can distill fermented apple-juice in the same way, and then you have apple brandy, or apple whisky—fermented peach-juice, and then you have peach brandy. And so from every fermented or rotted liquid, you can distill the alcohol and throw the sediment away, or feed it to the hogs.—Story's "Alcohol," p. 43.

In Jamaica a mixture of water and molasses with the skim-mings of the clarifier and evaporating coppers [in sugar-making] is fermented, and a vinous liquid thereby obtained which by distillation and rectification yields rum.—Pereira's "Materia Medica," p. 582.

68a. The highest concentration possible by distillation gives ninety per cent. of alcohol, still leaving ten per cent. of water.—"Chambers' Encyclopedia," art. Alcohol.

Rectified spirit, as spirit of wine for burning in a lamp, still contains, when of ordinary strength, about twenty-five per cent. of water.—*Ib.*, art. Distillation.

69a. See "Lesson Book," page 67.

LESSON VII.

71a. By chemical action we signify that which occurs when two or more substances so act upon another as to produce a third substance differing altogether from the original ones in properties, or when one substance is brought under such conditions that it forms two or more bodies differing from the original ones in properties.—Roscoe's "Elementary Chemistry," p. 1.

74a. The formation of aleohol is the direct inevitable result of fermentation. But in all these cases the aleohol did not pre-exist or form a constituent element of the substances, by the mixture and working of which it was evolved. It did not exist in the sugar nor in the starch, nor in the malted grain, nor in the grapes nor in their fresh juice.—“Regimen and Longevity,” by Dr. John Bell, p. 349.

74b. Fermentation is a chemical action effected by certain substances and transferred to others, the primary substances being at the same time decomposed.—Porter’s “Principles of Chemistry,” p. 541.

76a. The fermentation in which aleohol is produced is the vinous or aleoholic. If this be not checked, the process is liable to run on to another stage; the ferment is capable of attacking the aleohol itself and converting it to acetic acid, the active principle in vinegar.—Youmans’ “Handbook of Household Science,” p. 260.

79a. When expressed in the simplest form, fermentation or putrefaction may be described as a process of transformation; that is, the new arrangement of the particles or atoms of a compound.—Liebig’s “Organic Chemistry,” Part II. 7.

79b. See “Juvenile Temperance Manual,” p. 22.

83a. Roseoe’s “Elementary Chemistry,” pp. 253 and 309.

LESSON VIII.

87a. Alcohol is so greedy of water it will pick it up from watery textures and deprive them of it until by saturation its power of reception is exhausted —“Cantor Lectures,” p. 72.

90a. In our museums, the specimens there preserved in a moist state are immersed in spirit.—“Cantor Lectures,” p. 31.

91a. Wilson’s “Catechism.”

93a. If aleohol be brought into contact with the living structures of the body in a pure form, it has such an affinity for the water in those structures that it seizes the water and renders the parts hard and dense.—“Lesson Book,” p. 115.

94a. Liebig himself being witness, and all sound physiology along with him, active metamorphosis of tissue is the very con-

dition of health, the very element of organic life. It is with many the very definition of life; any arrest put upon it (obvious cases excepted) is a step out of health, and the arrest put upon it by alcohol is the worst arrest of all.—Guthrie's "Temperance Physiology," p. 192.

95a. Guthrie's "Temperance Physiology," p. 192.

LESSON IX.

96a. "Lesson Book," p. 19.

97a. "Lesson Book," p. 15.

98a. It is the strong affinity which alcohol has for water that enables it to play such dreadful havoc on a soft mass of flesh like the human body, which is just a vast filter, and must be kept soft and free from contraction in order to filter aright.—Wilson's "Catechism," p. 28.

In its passage through this minute circulation, the alcohol finds its way to every organ. To this vein, to these muscles, to these secreting or excreting organs; nay, even into this bony structure itself, it moves with the blood.—"Cantor Lectures," p. 75.

99a. If brandy be retained for five minutes in the mouth, the surface of the skin is whitish through the coagulation of its albumen, and the whole mouth feels as if it were contracted.—Wilson's "Catechism," p. 28.

100a. Story's "Alcohol," p. 98.

103a. Gray's "Anatomy," Brown's "Physiology," and Dunglison's "Dictionary."

By the course of experiment I learned step by step that the true action of alcohol in a physiological point of view is to create paralysis of nervous power.—Richardson's Lecture, "Results of Researches on Alcohol," p. 10.

103b. When alcohol sufficient is injected with the blood streams into the nerve pulp, much of the water that is designed to preserve the moist and workable condition of the pulp is withdrawn from it to satisfy the ardent thirst of the exacting liquid, and the nerve pulp is in consequence so hardened and dried as to be spoiled for its proper office. This delicate nerve pulp is the one

most immediately sensible of the introduction of alcohol into it because of the uncontrollable impulse this compound—alcohol—has to draw water into itself.—“Physiological Influence of Alcohol,” in *Edinburgh Review*, 1875.

104a. Pure alcohol coagulates all the fluids of animal bodies except urine, and hardens the solid parts; applied externally, it instantly contracts the extremities of the nerves it touches and deprives them of sense and motion, by this means casing them of pain, but at the same time destroying their use.—Dubrunfaut on “Distillation,” quoted in Reid’s “Cyclopedia,” p. 29.

106a. “Bound, and How,” by Dr. Charles Jewett, p. 10.

LESSON X.

108a. Alcohol is a poison forever at war with man’s nature.—Dr. Thomas Sewell, quoted in Reid’s “Cyclopedia,” p. 61.

109a. When persons have taken sufficient alcohol to affect them, they are said to be intoxicated, the literal meaning of which is, poisoned. The word is derived from *toxicum*, the Latin for *poison*: and from this we have the word *toxicology*, which signifies the science which treats of poisoning and poisons. We have also “toxic agents,” which mean poisons, and intoxication, which signifies the state or condition of being poisoned.—“Youmans on Alcohol,” p. 71.

109b. The condition of drunkenness, in all its stages, is one of poisoning.—“Carpenter on Aleoholic Liquors,” Am. ed., p. 30.

110a. The physical cause of intoxication it will, therefore, be understood, is an absolute, if passing, disorganization of the great nerve centers and brain. The delicate pulp-like structure of these highly-vitalized organs is for the time so changed by the presence of the spirit in its substance, that it ceases to be able to perform its ordinary office.—“The Physiological Influence of Alcohol,” in *Edinburgh Review*, 1875.

Spirits and poison mean the same thing.—Sir Astley Cooper, quoted in “Glass of Ale,” p. 14.

112a. “Physiological Action of Alcohol,” page 12.

113a. What is alcohol? The answer is, a poison. It is so re-

garded by the best writers and teachers on toxicology. I refer to Orfila, Christisson, and the like, who class it with arsenic, corrosive sublimate, and prussic acid. Like these poisons, when introduced into the system it is capable of destroying life without acting mechanically. Introduced into the system, it induces a general disease as well marked as fever, small-pox, or lead poison.—Dr. Willard Parker, quoted in speech of Hon. Henry W. Blair in Congress, Jan., 1879. See also "Youmans on Alcohol," p. 71

114a. Dr. Story quotes several Dispensatories, and a large number of other medical authorities of the highest standing, who call alcohol a poison.—Story's "Alcohol," pp. 76-80.

116a. "Lesson Book," p. 112.

119a. Handbill tract—"A Slow Poison."

120a. Let it not be objected to alcohol, as a poison, that in small or moderate quantities it does not kill. It is not necessary to the action of poisons that they be always swallowed in fatal doses.—"Youmans on Alcohol," p. 73. See also Dr. Johnson's "Letters" in Reid's "Cyclopedias," p. 28.

120b. See Reid's "Cyclopedias," p. 640; and "Chambers' Encyclopedia," art. Arsenious Acid.

121a. Dr. Chadwick says,—When taken pure, or almost pure, in sufficient quantity, it acts as a poison, and may produce death in a few minutes, or in the course of some hours. When taken in smaller quantities for a length of time it tends to shorten the duration of life, and may produce many different diseases which terminate in death.—"Essay on Alcohol."

122a. See *Medical Temperance Journal* for Jan., 1880, p. 63.

LESSON XI.

124a. All persons who indulge much in any form of alcoholic drink are troubled with indigestion.—"Lesson Book," p. 206.

126a. Alcoholic liquors coagulate and precipitate the pepsine in the watery gastric juice, and if not quickly absorbed by the stomach into the blood, they would in this way effectually stop digestion.—Youmans' "Handbook of Household Science," p. 379.

127a. "Physiologeal Action of Aleohol," p. 6; and Story's "Aleohol," p. 120.

Dr. Cheyne says that nothing more effectively hinders digestion than aleohol; that many hours, and even a whole night after a debauch in wine, it is common enough to reject a part or whole of the dinner undigested. I hold that those who abstain from aleohol have the best digestion, and that more instances of indigestion, of flatulency, of acidity, and of depression of mind and body are produced by aleohol than by any other single cause.—"Results of Researches on Aleohol," by Dr. B. W. Richardson, p. 13.

129a. See Experiments of Dr. Monroe in Story's "Aleohol," p. 119.

Aleohol when added to the digestive fluid produces a white precipitate, so that the fluid is no longer capable of digesting food.—Dr. Dundas Thompson, quoted in Story's "Aleohol," p. 120.

130a. Story's "Alcohol," page 124; also Beaumont's "Physiology and Experiments."

130b. Story's "Aleohol," p. 128; also "Pathology of Drunkenness." (The last-named is a five-cent pamphlet, the key to Dr. Sewall's Charts. In these Charts [prices \$9 to \$12], the gradations of disease in the drunkard's stomach are vividly pictured. Some public schools have already purchased sets of them to hang on the walls. To illustrate these lessons they would be simply invaluable).

132a. Persons addicted to the use of ardent spirits are usually dyspeptic.—Percira's "Materia Medica," Part I., p. 203, English edition. Story's "Aleohol," p. 127.

133a. Sewell's "Pathology," pp. 9-10.

135a. Similar to the rum blossoms sometimes seen on the face of the drunkard.—Dr. Sewell's "Pathology," p. 6.

135b. Story's "Aleohol," p. 138.

136a. It may be asserted with confidence that no one who indulges habitually in the use of aleoholic drinks, whether in the form of wine or more ardent spirits, possesses a healthy stomach. Whenever this organ fails to perform its office, all the other functions become deranged and the whole system lan-

guishes.—Thos. Sewell, M.D., of Columbian College, Washington, D. C.

136b. "Pathology of Drunkenness," p. 12.

LESSON XII.

138a. From the stomach it is absorbed quickly into the veins, and mixing with the blood in them is carried by the circulation into every vascular organ and part.—"Lesson Book," p. 115.

138b. In young subjects there is usually vomiting, with faintness; followed by gradual relief from the burden of the poison.—"Cantor Lectures," p. 91.

138c. If it (nature) sternly revolts against anything we take in and seeks at once to extrude it, surely it thereby declares in its loudest tone that such a thing is a dangerous or deadly intruder.—Guthrie's "Temperance Physiology," p. 218.

139a. It is to all intents a foreign agent which the body gets rid of as fast as it can.—Dr. Markham in *British Medical Journal*.

140a. On pp. 98-101 of Story's "Alcohol" is a most admirable illustration—handing hot balls down a line of men.

141a. It did not require college training, but merely my sense of smell to tell me, what chemical analysis has so often demonstrated, that alcohol comes out of the body as it goes into it, which is a pretty suggestive hint that the body wants to have nothing to do with it, but treats it as an intruder as it treats every other foreign body, and gets rid of it as soon as possible.—Dr. A. H. McMurtry in *Medical Temperance Journal* for Jan., 1871, p. 89.

142a. The alcohol is carried by the tide to the heart, the inner surface of which organ, disturbed by the presence of the alcohol, pumps away so much faster to get rid of the intruder.—Dr. Henry Munroe, quoted in Story's "Alcohol," p. 103.

143a. The rest passing round and round is probably decomposed and carried off in new forms of matter.—"Cantor Lectures," p. 75.

145a. What nature throws away she can not use for the building up of the body and keeping all its parts in proper working

order. The reason she throws it away is because she can not use it. Now, she invariably throws alcohol away.—*Medical Temperance Journal*, Jan., 1871, p. 89.

147a. But when we come to look at alcohol, we can see no such qualities or uses for the purposes of food of any kind, etc.—“Lesson Book,” p. 117.

LESSON XIII.

150a. The features of those who indulge in strong drink exhibit the evidences of the evil committed by this subtle foe. The vessels over and over again distended with blood, show at last the fact of such distention in those dark-red or all but blue discolorations of the face which are so often seen in the hard drinker.—“Lesson Book,” p. 201. “Cantor Lectures,” p. 83.

152a. “Lesson Book,” p. 191.

153a. It is the same as the flush from blushing, or from the re-action of cold. It is the dilatation of vessels following upon the reduction of nervous control, which reduction has been induced by alcohol.—“Cantor Lectures,” p. 84.

154a. “Cantor Lectures,” p. 85-88.

155a. “Cantor Lectures,” p. 88.

155b. “Lesson Book,” p. 179. The man who takes a pint of whisky a day, or the equivalent of that in other drinks of alcohol, makes his heart beat 26,000 times extra every day.—Dr. Richardson in “Dialogues on Drunk,” pp. 180 and 181.

157a. It can not be too forcibly impressed that this condition is universal in the body. If the lungs could be seen, they, too, would be found with their vessels injected; if the brain and spinal cord were laid open to view, they, too, would be discovered in the same condition. If the stomach, the liver, the spleen, the kidneys, or any other vascular organs or parts could be exposed, the vascular engorgement would be equally manifest.—“Cantor Lectures,” p. 89.

158a. “Cantor Lectures,” p. 90.

159a. When it enters the blood in large quantities it causes the corpuscles, rendered smaller and irregular from loss of water,

to adhere together in masses. This leads to congestion of blood, etc.—“Lesson Book,” p. 127.

159b. It is then said that apoplexy, which means, literally, striking down, has taken place.—“Lesson Book,” p. 128.

160a. The flushed aleoholie face is the outward and visible sign of the flushed aleoholie brain.—“Dialogues on Drink,” p. 86.

160b. That very plethora and floridity is nature’s flag of distress.—Guthrie’s “Temperance Physiology,” p. 168.

160c. A lady of flushed face, when consulting Dr. Cheyne, of London, happened to see herself in a glass. “Wherever did I get such a nose as this?” she exclaimed. “Out of the deeranter, madame,” replied the doctoer.—“Doctors and Patients,” Vol. I., p. 252.

161a. The queen had too much to eat, too much to drink, too little to do; and these causes colored her complexion with a semblance of health and strength far more dangerous than the wan hue of less perilous disease. Hence the mistaken report of “Queen Anne’s good looks” as recorded by her historian, Senator Loekhart.—Agnes Stickland’s “Queens of England,” Vol. VI., p. 329.

LESSON XIV.

162a. It has been regarded as a kind of food by some chemists and practitioners, but their opinions have been theoretical and not borne out by facts.—Dr. Willard Parker in “Science and Inebriate Asylums,” p. 2.

162b. It has been admitted by those who differ from total abstainers most largely that it can not be proved that alcohol is able to evolve force in the body under any circumstances, or that it is capable of being changed or transmuted in any way within the system into an element of physical well-being.—“Stimulants and Strength,” by Dr. H. S. Patterson, p. 5.

163a. While no part of an organized being can serve as food to vegetables, until by the process of putrefaction and decay, it has assumed the form of inorganic matter; the animal organism requires for its support highly organized atoms.—Liebig’s “Organic Chemistry,” Part I., p. 1.

164a. Alcohol is made from grain, but it is not found in it. Smoke is made from wood, yet there is no smoke in wood; it is made by the destruction of the latter. Alcohol is made by the destruction of fruits and grains.—Dr. J. H. Kellogg in “Alcoholic Poison,” p. 54.

165a. “Bacchus Dethroned,” p. 93.

165b. Dr. Lancaster advises to avoid taking wine, spirits, and beer, on an empty stomach.—“Bacchus Dethroned,” p. 134.

165c. Foods restore the forces without the organism betraying, by disturbed function or by outward agitation, the labor of repair which is accomplished silently in the woof of the tissues. Alcohol, on the other hand, immediately provokes, even in a moderate dose, an excitement which extends throughout the entire economy.—Lallemand, Perrin, and Duroy in “The Role of Alcohol.”

167a. Story’s “Alcohol,” pp. 94-96.

170a. “Is Alcohol Food?” p. 6.

170b. Baron Liebig says: “Beer, wine, spirits, etc., furnish no element capable of entering into the composition of blood, muscular fiber, or any part which is the seat of the vital principle.”—*Ib.*, p. 7.

171a, b. Plenty of food and sound digestion are the best sources of heat.—Sir John Richardson in “Bacchus Dethroned,” p. 128. See also pp. 85 and 86. Liebig’s “Letters on Chemistry,” Fourth English Edition, p. 70; also Guthrie’s “Temperance Physiology,” p. 106.

172a. The fact that individuals have in several instances been known to live from thirty to sixty days while taking only water, shows conclusively that those persons who lived a shorter time on brandy and water, lived in spite of the alcohol, instead of by the aid of it.—“Alcoholic Poisons,” p. 48.

173a. Quoted in “Is Alcohol Food?” by Dr. F. R. Lees, pp. 6 and 7.

174a. “Habits and Health,” p. 9 By John Gill, M.D. English Edition.

LESSON XV.

176a. Story’s “Alcohol,” p. 37.

177a. “Lesson Book,” p. 37.

180a. About 11 o'clock, the employer came into the house to refresh himself with a nap before dinner, and the hired man about the same time lay down on a swath of rye in the field (both had been drinking).—"Temperance Reformation," p. 160.

182a. All alcoholic fluids and all stimulants are in reality depressants. They take up force and apply it in liberating themselves from the body they have entered, by which means they lead to exhaustion and paralysis of power.—Dr. Richardson in "Dialogues on Drink," p. 177.

183a. See Beer Series Tract, No. 17, "Beer for Workingmen."

184a. Reid's "Cyclopedia," p. 514, and "Morning Dewdrops," p. 199.

186a. Buckingham's "Temperance Reformation," pp. 18-23, and "The Workingmen's Experiment."

187a. "Juvenile Temperance Manual," p. 64.

188a. Some years ago seventeen London smiths and cutlers published their testimony, closing as follows: "We have found ourselves much more capable of performing our work with less fatigue, with our health improved and our domestic comforts greatly increased."—"Morning Dewdrops," p. 297.

189a. Bell's "Report," pp. 43 and 44. See also Harrison's "Athletic Training and Health," p. 55.

189b. "Lesson Book," pp. 180-184.

189c. In a word, I found that the helplessness of muscle under which the inebriated man sinks beneath the table, and under which the paralyzed inebriated sinks into the grave is a cumulative process beginning so soon as the physiological effect of alcohol is pronounced, and continuing until the triumph of the agent over the muscular power is completed.—B. W. Richardson in "Results of Researches on Alcohol," p. 12.

190b. Richardson's "Dialogues on Drink," p. 178.

LESSON XVI.

192a. When alcohol is taken in small quantities repeated daily, the individual usually slowly increases in weight, not from increased nutrition, but from retarding the waste and retaining the

old atoms longer in the tissues.—“Verdict of Science,” by N. S. Davis, M.D., p. 6.

193a. “Lesson Book,” p. 186.

194a. Fat as an accumulation in the system, while often desirable and normal, is not so constant a sign of perfect nutrition as would be the development of muscle.—“Alcohol as a Food and Medicine,” by Dr. Ezra Hunt, p. 26.

194b. The London draymen who have free use of the vat will often, in summer, drink from two to four gallons of porter daily, and not unfrequently they far exceed that amount. Their huge forms are so many skinfuls of congested organ and tissue in which disease finds its congenial lair.—Guthrie’s “Temperance Physiology,” p. 177.

195a. Some of the fattest persons I have met with have been females who have contracted the habit of drinking frequently some mixture of alcohol and sugar such as we find in our champagne and other wines.—Dr. Murchison in “Croomian Lectures,” quoted in *Medical Temperance Journal*, July, 1874.

195b. Sir Astley Cooper, M.D., was on one occasion called to a London drayman, a powerful, fresh-colored, healthy-looking man who had suffered an injury in his finger from a small splinter. Suppuration had taken place in the wound, which appeared of a trifling character. This distinguished surgeon, as usual, opened the small abscess with his lancet. Returning to the man a few minutes later, he found him in a dying state.—Guthrie’s “Temperance Physiology,” p. 179.

The Maories of New Zealand, who never drank alcoholic liquors, would pay but little attention to large wounds made by a broad-axe, which would heal up kindly without suppuration.—See also Reid’s “Cyclopedia,” p. 539.

196a. M’Nish says those addicted to the use of malt liquors increase enormously in bulk. They become loaded with fat, their chins get double or triple, the eye is prominent, and the whole face bloated and stupid. Their circulation is clogged, their blood dark and sлизy.—“Anatomy of Drunkenness.”

197a. In the arm of a toper the flesh is of a pale yellow hue, flabby and inelastic, streaking with grease the knife that cuts it. On close inspection dark globules of oil are seen in the tissue.

This is "fatty degeneration," the tendency to produce which is a striking effect of alcoholic narcotization. It is a stage of the very same process which occurs in the sepulchre when the corpse is converted into "grave wax" or "adipocere," a cerous fat, the result of chemical decomposition.—Dr. F. R. Lees in "Guthrie," p. 169. See also "Physiological Action of Alcohol," p. 10.

198a. See case of sudden death from "fatty degeneration."
Ib., p. 11; also "Lesson Book," p. 218.

LESSON XVII.

200a. On its first entering the circulation after absorption by the stomach, alcohol finds its way through the vessels of the portal system and permeates all the tissues of the liver.—"Report of Com. on Relations of Alcohol to Medicine," by John Bell, M.D., p. 55.

203a. Dr. Percy has also shown that alcohol may be detected in the bile of animals poisoned by it.—Carpenter on "Alcoholic Liquors," pp. 38 and 63.

204a. Alcohol acts on the liver by producing enlargement of that organ, and a fatty deposit, or the hob-nailed liver of the English writers.—*Ib.*, p. 56. Drs. Magendie and M'Nish found that the liver suffered the most from alcohol, the brain next, and the kidneys and blood next.—Story's "Alcohol," p. 108.

204b. Dr. Francis in Reid's "Cyclopedia," p. 59.

205a. English prisoners made by Tippoo Saib, though kept upon a scanty pittance of bread and water, were cured of liver complaints of long and severe duration.—Reid, p. 499. It (alcohol) does not give the fever, but it so inflames the liver and brain that the fever takes too firm a grasp to be got rid of.—Sir Charles Napier, quoted in Reid's "Cyclopedia," p. 526.

205b. "Glass of Ale," p. 13.

206a. Bell's "Report," p. 56.

207a. It is well known to the physicians of Mobile and New Orleans that the victims of yellow fever are chiefly those who drink freely.—Dr. Drake, of Cincinnati, quoted in Reid's "Cyclopedia," p. 522.

Effects of alcohol on the liver are given at large in Carpenter on "Alcoholic Liquors," Chap. 2, Section 6; also in "Pathology of Drunkenness," by Dr. Sewell, p. 15.

LESSON XVIII.

212a. Dr. Rush, of Philadelphia, says: "Spirituous liquors dispose the system to fevers and inflammations of the most dangerous kind, and half the diseases which are said to be produced by warm weather are produced by the spirits which are swallowed to lessen its effects upon the system.—Reid's "Cyclopedia," p. 520.

Those who drink nothing but water or make it their principal drink are but little affected by the climate, and can undergo the greatest fatigue without inconvenience, and are never subject to dangerous or troublesome diseases.—Dr. Mosley, quoted in Bell's "Report," p. 38.

212b. See cases in Bell's "Report," p. 38.
214a. Reid's "Cyclopedia," pp. 531 and 532.
215a. *Medical Temperance Journal* for October, 1871, p. 43.
215b. "Travels in Abyssinia," quoted in Reid's "Cyclopedia," p. 542.
216a. Guthrie's "Temperance Physiology," p. 242.
217a. Reid's "Cyclopedia," pp. 510-514.
218a. "Worship of Bacchus," p. 68.
218b. A brewers' paper maintaining that beer is better than tea, yet makes the following admission: "If workingmen must drink heavily of something besides water, something with a taste to it, let them drink oatmeal water, or water into which browned cornmeal has been thrown."—*Western Brewer*, August 15, 1880, p. 821.

219a. *Medical Temperance Journal*, p. 141.
220a. The majority of sunstrokes occur among brandy-drinkers.—Dr. Alfred J. H. Crespi in *Medical Temperance Journal*, April, 1877, p. 173. See also "Lesson Book," p. 202.
220b. Reid's "Cyclopedia," p. 521.

LESSON XIX.

222a. It is a sense of warmth that is felt, not an actual warmth that is given to the body.—“Lesson Book,” p. 147, *et seq.*

223a. Next morning (after some indulgence and slight exposure) he is feeble for his work at best, and it is fortunate if he is not laid up with a cold at the chest or with rheumatism.—“Lesson Book,” p. 152. After drinking deeper, and further exposure, “find themselves afflicted with some internal disease, such as congestion of the lungs, bronchitis, or rheumatic fever.”—“Lesson Book,” p. 160.

223b. The glow which is felt on the surface of the body after alcohol is taken is but due to the circumstance that the vessels of the surface, paralyzed by the alcohol, are surcharged with the warm blood from the heart, blood which is now giving up its vital heat to the outer air.—“Dialogues on Drink,” by Dr. Richardson, p. 178.

It was quite easy for a man to say that something that made him feel warm for a few moments warmed him, and it was not so easy for him to detect that the after excess of cold was due to that which he felt to be a warming agency.—“Lesson Book,” p. 167.

224a. A large party of men in the prime of life spent a very cold night on the western plains. Some drank to keep them warm. This is the close of the report of one of the party: “They all suffered just according as they took in the whisky—those that got drunk froze to death; those that drank less, but too much, died after a while; those that drank only moderately will feel it as long as they live. Three didn't drink any; they were only cold, but did not suffer nor freeze.—*Cincinnati Medical Repertory*, quoted in *Medical Temperance Journal*, October, 1872, p. 182.

See also “Cantor Lectures,” p. 113.

226a. Liebig's works; also “Lesson Book,” p. 168.

227a. In nearly all the cases of death caused by exposure to cold that I have known or heard of, it was found on inquiry that the persons so dying had taken some alcoholic drinks, not necessarily in large quantity, before going out into a low temperature, the effects produced being languor, drowsiness, inability or disinclination to walk, imperfect circulation, stupor, and

finally death. So well is this bad effect known by people in the far northwest of America and in Canada that they will seldom take even a single glass of spirits when about to be exposed to extreme cold.—John Rae, M.D., LL.D., in *Medical Temperance Journal*, July, 1878, p. 166.

227b. The Hudson's Bay Company have for many years entirely excluded spirits from the fur countries to the north, over which they have exclusive control, to the great improvement of the health and morals of their Canadian servants and of the Indian tribes.—Reid's "Cyclopedia," p. 520.

228a. "Cantor Lectures," p. 111, and Introductory Note.

228b. "Lesson Book," p. 160.

229a. I placed alcohol and cold side by side in experiment, and found that they ran together equally in fatal effect, and I determined that in death from alcohol the great reduction of animal temperature is one of the most pressing causes.—Dr. Richardson's "Researches on Aleohol," p. 12.

231a. Guthrie's "Temperance Physiology," p. 290.

232a. *Ib.*, p. 291.

234a. Guthrie's "Temperance Physiology," p. 283.

LESSON XX.

235a. The teacher may use and carry out whichever illustration is most familiar to his scholars.

236a. A preserved specimen can sometimes be procured of some physician.

237a. It is to the nervous system and especially to its great center, the brain, that aleohol is first attracted after it has entered the circulatory system. It is to all intents and purposes a cerebral poison.—Youmans on "Aleohol," p. 92.

Dr. Percy found that aleohol reached the brain in two minutes from the time it entered the stomach.—Reid's "Cyclopedia," p. 72.

237b. "Cantor Lectures," p. 75.

There is an article in the *Edinburgh Review* for 1875, containing a very fine description of the brain and the effect of aleohol upon it, though we can not accept all its teachings in other respects; with regard to the origin of aleohol, it is self-contradictory within the first four pages.

238a. The brain is an organ of very delicate structure, so much so, that before it can be dissected it has to be hardened by soaking it in alcohol, for alcohol hardens all albuminous things, and the brain is largely albuminous. So with the drinker: alcohol hardens the brain and the man dies. Doctors sometimes get a brain ready for dissection as soon as it leaves the skull. The drinker has hardened it.—Dr. Jewett's "Lectures."

244a. "Brown's Physiology and Hygiene" has four excellent Lessons on "Brain Poisons," of which alcohol occupies three and tobacco and opium the fourth.

245a. In "Drink, Pauperism, and Crime," in the *Herald of Health*, June, 1871, p. 242.

245b. The memory is less clear and retentive, the grasp of the intellect is enfeebled, there is less power of mental work, and less of that self-control and self-respect which gain the confidence of others.—"Alcohol: Its Use and Abuse," p. 48.

247a. The popular idea that alcohol brightens the intellect is accounted for in Richardson's "Lesson Book," p. 194.

247b. "Food and its Digestion," by Wm. Brinton, M.D., English Edition, p. 390.

249a. See Leaflet, "The Brave Student."



LESSON XXI.

250a. It is the fact that for the time being he is bereft of his senscs; he is a man who has gone mad.—"Lesson Book," p. 212.

250b. In his cups the drunkard is generally a temporary madman.—Dr. Hitchcock's "Report," p. 14.

251a. The newspapers bring daily reports of murders that would never have been committed but for the frenzy or recklessness induced by intoxication.—Harvey P. Peet, LL.D., in *Herald of Health*, June, 1871, p. 242.

252a. "What the Rope Means," by Rev. T. L. Cuyler.

255a. The near approach to actual death in which the victim of drink now lies is completely expressed by this phrase: "He is not dead, but he is dead drunk.—"Lesson Book," p. 158.

255b. "Lesson Book," p. 161. See also Elam's "Physician's Problems," p. 108.

256a. Drunkenness and insanity appear so near akin that drunkenness has been called voluntary insanity, and we often find that such voluntary insanity terminates in involuntary and incurable insanity.—D. Higginbottom, quoted in Story's "Alcohol," p. 233.

256b. Considering that the state of intoxication is itself, strictly speaking, a transient paroxysm of insanity, it can excite no surprise that a confirmed state of mental derangement should frequently result from the repetition of the cause which produces the single paroxysm.—Carpenter on "Alcoholic Liquors," par. 24.

257a. With the single exception of hereditary predisposition, intemperance is by far the most fruitful of all the causes of brain disease, and even hereditary predisposition is often but another name for parental intemperance. If we add to all this evil the insanity produced by the poverty, disease, and violence which intemperance begets, it is surely within the truth to say that half the existing cases of insanity are due directly or indirectly to this social curse.—"Insanity and Intemperance," An Essay read by Dr. Yellowlees, M.D., Medical Superintendent of the Glamorgan County Asylum, before the Physiological Section of the British Medical Association in London, 1873, and published in the *Medical Temperance Journal*, Jan., 1874, pp. 79, 80.

Lord Shaftesbury having acted as Chairman of the Commission on Lunacy in England for sixteen years, says that fully six-tenths of all the cases of insanity in that country arise from their habits of intemperance.—Dr. Lees' "Prize Essay."

The learned Superintendent, Dr. Shepherd, of Colney Hatch (Lunatic Asylum), says that forty per cent. of those who were brought into that asylum, during the year 1876, were the direct or indirect victims of alcohol.—Dr. Richardson, in "Action of Alcohol on Body and Mind," p. 58.

257b. Not one of the transmitted wrongs, physical or mental, is more certainly passed on to those yet unborn than the wrongs that are inflicted by alcohol.—"Cantor Lectures," p. 178.

O. S. Fowler, in "Hereditary Descent," p. 164, gives a remark-

able case where a tippling senator (from a sober family) handed down the drink curse to several successive generations.

See also Reid's "Cyclopedia," article *Insanity*, p. 92; Story's "Alcohol," p. 288; also many proofs in "Mental and Moral Effects of Alcohol."

257c. No vice is more hereditary than intemperance.—Dr. Yellowlees (as above), p. 80.

I believe the mere habit of intemperance in the individual rarely produces this condition (insanity), but that it is usually a result of the baneful heritage entailed on their descendants by intemperate progenitors; the vice of one generation becoming the weakness of the next, liable to be evoked at any time by (indulgence in) the parental vice, and thus bringing a double curse.—*Ib.*, p. 81.

The offspring of the confirmed drunkard will inherit either the original vice or some of its countless protean transformations. . . . As a rule none can escape the inevitable law written in the most hidden recesses of our nature, . . . that the children do suffer for the sins of the parent, even to the third and fourth generation.—Elam's "Physician's Problems," p. 82; see also Reid's "Cyclopedia," p. 77; Carpenter on "Alcoholie Liquors," par. 36; and Story's "Alcohol," pp. 241-258.

258a. See "Autobiography of John B. Gough."

260a. Delirium tremens may never occur to the vast majority of even excessive drunkards; and its outbreak is not caused by abstinence, but the abstinence is a symptom of the outbreak.—Dr. F. E. Anstie, in a Lecture published in *Medical Temperance Journal*, April, 1873, p. 121.

The condition known as delirium tremens may be, and perhaps most frequently is, produced without actual drunkenness in the common use of that word.—"Alcohol: its Use and Abuse," p. 46.

LESSON XXII.

265a. That alcoholic liquors possess the power to half kill or entirely suspend for a time one important function of a human being—the power to feel—was long unknown, not only to medical

men, but to all thoughtful observers of what is passing in the world about us.—“Bound, and How,” by Dr. Charles Jewett, p. 9. See Lesson 9.

268a. “Life of Dr. Jewett,” p. 392.

Like ether and chloroform, its presence diminishes the sensibility of the nervous system and brain, thereby rendering the individual less conscious of all outward and exterior impressions. The alcohol does not relieve the individual from cold by increasing his temperature; nor from heat by cooling him; nor from weakness and exhaustion by nourishing his tissues; nor yet from affliction by increasing nerve power; but simply by diminishing the sensibility of his nerve structures, and thereby lessening *his consciousness* of impressions, whether from cold, or heat, or weariness, or pain.—“Verdict of Science,” by Dr. N. S. Davis, p. 5.

268b. It is illustrated by the trick of the jockey who has a foundered horse to sell. The purchaser is coming on the morrow, and to-night he takes a knife and adroitly severs the nerves of sensation. The horse in the morning travels without any show of lameness. But is he cured? No; the lameness is covered up. The sundered nerves do not telegraph the disease to the brain. The telegraphic wire is cut. The founder is there the same as ever. So the patient who submits to aleoholic medication has his disease covered up. His nerves of sensation are blunted, and refuse to carry any intelligence to the brain. The man or woman is deceived; and I am sorry to say that often the physician is a party to the deception.—Thayer’s “Life of Dr. Jewett,” p. 392.

271a. Yet while it (alcohol) is doing the work of death it promises and counterfeits life.—Thayer’s “Life of Dr. Charles Jewett,” p. 395

LESSON XXIII.

275a. With some the progress of a fit of drunkenness is never attended by hilarity or other conspicuous excitement, and a dreamy and subdued forgetfulness seems all that is produced.—“Chambers’ Cyclopedias,” art. Intoxication.

277a. “Dialogues on Drink,” p. 41.

279a. It is claimed to be a breach of politeness not to partake of the punch on the sideboard of your host. . . . Not so. A host always provides a scraper at the door, but it is no breach of politeness when I came clean-footed from the carriage, that I do not stop and rasp for five minutes on that scraper. I do not need it nor his punch-bowl either. Guests have rights as well as hosts, and if hosts will drink, let them never tempt the guest whom hospitality binds them to protect.—“Scientific Certainties about Alcohol,” by Rev. Henry Warren, D.D.

279b. Alexander the Great, under the excitement of wine killed his dearest friend, Clitus. As soon as he came to his senses he fell into the deepest sorrow for several days, so that he would have killed himself if he had not been restrained by his attendants.—Plutarch, quoted in “Bacchus,” p. 28.

280a. One feels musical and undertakes to sing. To him the music is magnificent, and to his tipsy companion delightful. But to a sober, sensible man the music is flat, insipid, discordant, and harsh. Others among them say things supposed to be witty, and they all laugh heartily at each other’s brilliancy. But if they should hear the same stuff read after the poison of their brains had ceased to operate, they would not call it wit nor brilliancy.—Story’s “Alcohol,” p. 213.

281a. Alcohol produces narcotism, not a pure, undisturbed, and refreshing sleep. . . . A bad condition altogether and subversive of the natural rest.—Dr. Richardson in “Dialogues on Drink,” p. 83.

281b. The bulk of the intemperate who apply for medical advice, complain that however drowsy they may feel when they go to bed, an intolerable restlessness makes them turn from side to side and forbids sleep for a considerable time; that when they fall asleep they are apt to wake with a start.—Dr. F. E. Anstie, in *Medical Temperance Journal*, April, 1873, p. 120.

See “Chambers’ Cyclopaedia,” and Hammond on “Wakefulness.”

281c. Rev. Sidney Smith, one of the founders of the *Edinburgh Review*, says in a letter to his daughter: “Let me state some of the good arising from abstaining from all fermented liquors. First sweet sleep (having never known what sweet sleep

was), I sleep like a baby or a plough-boy. If I wake, no needless terrors, no black visions of life, but pleasing hopes and pleasing recollections.—Bell's "Report," p. 47.

282a. Tract, New Series, No. 58, "Secret of Alcoholic Power."

283a. Proverbs xx. 1.

283b. "Bacchus," p. 216.

LESSON XXVII.

319a. Wine is the most powerful of all things for exciting and inflaming the passions of all kinds.—LORD BACON.

319b. The police reports of all cities indicate that rows, riots, and bloody affrays resulting in manslaughter and murder, as well as crimes against decency, are perpetrated by persons who are intoxicated.—Prof. Sizer in *Herald of Health*, February, 1871.

323a. Whenever and wherever intemperance is most prevalent crime is most abundant. This recognized fact has created an elementary principle in the criminal common law that drunkenness is no excuse for crime. No principle is better, or was earlier settled, and it was vested on the manifest fact that, if allowed as an excuse, all crime would prepare and fortify itself by intoxication. Hence, courts even in capital cases were compelled to treat drunkenness as an aggravation of crime.—"Intemperance and Crime," by Judge Noah Davis, p. 7.

Intoxication is, in point of law, no excuse for any wrong done by the drunken party.—"Chambers' Cyclopedias," art. Intoxication.

327a. Mr. Mooney, a brewer of Visalia, Cal., writes as follows: "When I came to this place some twelve years since, the staple drink was whisky. The result was a man killed every month or so in drunken brawls. Since then times have changed, as most people drink beer, and we seldom have any murders or fights as the result of beer-drinking.—*Western Brewer*, August 15, 1880.

328a. Dr. Harris, Corresponding Secretary of the Prison Association of New York, conversed with seventeen murderers in prisons, three of whom were sent to insane asylums, and the remaining fourteen all owed their crime to drink—particulars given in tract No. 125, "The Relations of Drunkenness to Crime."

The prison agent of Philadelphia reports thirty-four murders for the year 1870, and every one of them distinctly traceable to intemperance.—“Our Wasted Resources,” p. 151.

Mr. Simmons, governor of Canterbury prison for fifteen years, says that among the 22,000 prisoners there during that time, he had never met with one that was a teetotaler.—“Bacchus Dethroned,” p. 38.

328b. Day by day I read in the faces of the criminal class one influence—strong drink; until at last I am as familiar with the strong drink face as you can be.—The Judge to the Doctor in Richardson’s “Dialogues on Drink,” p. 4.

That habits of intemperance are the chief cause of crime is the testimony of all judges of large experience. Sir Matthew Hale said that four-fifths of the worst crimes “are the issue and product of excessive drinking.”—*Ibid.*

329a. “Intemperance and Crime,” by Judge Noah Davis, p. 9.

330a. Two-thirds of the boys in the Glasgow House of Refuge had drunken parents. Among the girls, nineteen cases out of twenty were traceable to drink.—Reid’s “Cyclopedia,” p. 216.

331a. During the Father Matthew Reformation in Ireland, between 1838 and 1840, the consumption of spirits fell off 5,000,000 of gallons; the numbers imprisoned in Bridewell, the principal city prison, fell off in a single year from 136 to 23. The Smithfield prison was actually closed.—“Intemperance and Crime,” pp. 12, 14, 15.

LESSON XXVIII.

334a. Dr. Young, Chief of Bureau of Statistics, estimates the amount for the year ending June, 1871, at \$600,000,000; amount for the year 1872 is estimated by Dr. Hargreaves at \$735,000,000.—“Our Wasted Resources,” pp. 43 and 51.

334b. We allow them to make 100 per cent. profit.—*Ib.*, p. 51.

335a. The percentage paid for labor in making boots and shoes is 28.5; clothing, 21.57; furniture and house fixtures, 29.65; cotton goods, 19.98; woolen goods, 15.86; while for the manufacture of liquors only 8.5 is paid for labor.—“Our Wasted Resources,” p. 107.

339a. These persons argue as though money alone was wealth, whereas, strictly speaking, it is only the representation of wealth; and they overlook the fact, too, that when there is a transfer of money from the buyer's to the seller's pocket there should be a transfer of some equivalent from the seller to the buyer, or, as Adam Smith puts it, there should be not one value only, but two.—“Our National Resources, and How they are Wasted,” by Wm. Hoyle, M.P., p. 53.

341a. *Ib.*, p. 54.

LESSON XXIX.

353a. In truth, from the first some little harm is done.—“Lesson Book,” p. 155.

353b. This weakening of the voluntary control over the mental operations must be regarded as an incipient stage of insanity.—Carpenter on “Alcoholic Liquors,” Chap. I., 12.

353c. “Cantor Lectures,” p. 154.

Alcohol causes disease of the lungs, liver, kidneys, and brain.—“Guy’s Principles of Forensic Medicine,” (third English ed.), p. 341.

354a. “Lesson Book,” pp. 203, 205.

354b. Reid’s “Cyclopedie,” p. 79.

355a. *Boston Medical Journal*, quoted in Reid, p. 86.

356a. “Cantor Lectures,” p. 139; and “Lesson Book,” pp. 151, 152.

357a. “Cantor Lectures,” pp. 162–168.

359a. “Lesson Book,” p. 124.

Drunkards suffer from functional and organic diseases of all the important organs of the economy (followed by specific names of seventeen diseases, and general terms for many more).—“Guy’s Principles of Medicine,” p. 528.

I have no hesitation in attributing a very large proportion of some of the most painful and dangerous maladies which come under my notice, as those which every medical man has to treat, to the ordinary and daily use of fermented drinks taken in quantities which are conventionally deemed moderate.—Sir Henry Thompson, “Traet” 113.

359b. Reid's "Cyclopedias," p. 55.

359c. *Ib.*

360a. *Ib.*, p. 76.

361a. Still slops form an imperfect diet for animals. It is well known by all concerned that wounds on still-fed hogs do not heal. They are withdrawn from the pen and sent to the butcher at once.—Dr. Jewett to the Ohio distiller in "Forty Years' Fight," p. 340.

361b. Reid's "Cyclopedias," p. 75.

362a. The first warning is often an attack of gout, which is itself a sign of degenerative decay.—Richardson's "Dialogues on Drink," p. 63.

362b. Drinking leads to the degeneration of the tissues.—Sir Wm. Gull, M.D., F.R.S., F.C.P., before the Select Committee of the House of Lords on Intemperance, p. 6.

362c. Sugar putrefying makes alcohol. Alcohol is a stage in the process of decay and death. It putrefies humanity physically (as many a bloated form testifies), socially, and morally.—Dr. Jewett, in Thayer's "Life of Jewett," p. 391.

362d. Very soon after the yeast is mixed the whole contents of the two begin to pass into a state of commotion; much gas is evolved; causes a frothing on the surface of the liquid; appears of a yellowish-white or a brownish-yellow.—Chambers' "Cyclopedia," art. Beer.

363a,b. Alcohol is a product of dissolution, of the wreck and disorganization of the principles of human food. It has the same origin as those malignant and fatal exhalations which constitute the germs of pestilence, the death and putrefaction of organic matters.—"Youmans on Alcohol," quoted in Reid's "Cyclopedia," p. 21.

365a. There seems to be at present little room for doubt that typhus and diphtheria, malarial fevers, all of the contagious diseases, are produced by these agents (invisible germs from decaying matter).—*Good Health*, Sept., 1880, p. 280.

365b. It has been clearly shown that typhoid fever and several other serious diseases may be communicated to man by polluted water.—*Ib.*, p. 285.

366a. In two large friendly societies under his care—one of to-

tal abstainers and the others non-abstainers—Dr. Monroe proved that the latter averaged annually nearly twelve days sickness and one and a half per cent. of deaths, while the abstainers averaged less than two days sickness, and the deaths were less than one-quarter per cent.—“Bacchus Dethroned,” p. 132.

Dr. Gourlay, the medical attendant of a temperance benefit club, returned his salary to the members because they had given him no trouble.—Reid’s “Cyclopedia,” p. 517.

LESSON XXX.

367a. A very large number of people in society are dying day by day, poisoned by alcohol, but not supposed to be poisoned by it.—Testimony of Sir Wm. Gull, M.D., F.R.S., F.C.P., Physician to the Queen, Prince of Wales, and Guy’s Hospital, before the Select Committee of the House of Lords, on “Intemperance,” July, 1877, p. 7.

367b. Reid’s “Cyclopedia,” p. 519.

368a. In almost all the cases of death more or less caused by alcohol, there is some disease or accident intervening which is credited with being the real cause. In many other instances in which persons do actually die of delirium tremens, or even from the immediate effects of an overdose of alcohol, the physician will trump up some disease of a more respectable sound to give to the family, and this *respectable lie* gets into the vital statistics.—Dr. Homer O. Hitchcock in “Report of the Michigan State Board of Health,” 1874, p. 9.

371a. “The Worship of Bacchus a Great Delusion,” p. 156.

372a. Reid’s “Cyclopedia,” p. 130.

376a. *Medical Temperance Journal*, January, 1880, pp. 92-95.

377a. “Bacchus Dethroned,” p. 134.

378a. “Juvenile Temperance Manual,” p. 109.

378b. *Medical Temperance Journal*, January, 1880, p. 95.

LESSON XXXI.

380a. It is the nature of intoxicating liquors to produce the disease just described (*Oinomania*, or a craving for alcohol).

Hence, all who drink them regularly to any extent, even though it be within the so-called bounds of moderation, must expect to suffer; indeed, there are very few moderate drinkers who do not suffer to a greater or less extent from this disease.—“Bacchus Dethroned,” p. 21.

381a. To-day a man will take two ounces of alcohol, that is about half a pint of sherry, under certain conditions; to-morrow he will take the same under different conditions. The effect to-day does him as he thinks some good; the effect to-morrow will be less definite, so the next day he will think it necessary to take a little more, and so on, until the aleoholic constitution is completely established.—Richardson’s “Dialogues on Drink,” p. 163. See also “Lesson Book,” p. 183.

382a. “Lesson Book,” p. 113.

383a. “Lesson Book,” p. 11. The stimulant produces the craving, and the craving for the stimulant does not pre-exist in man.—Richardson’s “Dialogues on Drink,” p. 92.

384a. Persons drinking too much suffer in the intervals of sobriety and near the return of their accustomed indulgence a faintness and oppression about the praecardia which exceeds the patience of human nature to endure.—“Edinburgh Medical Dictionary.”

384b. An agent which brings on a morbid craving for itself—a craving which the wisest and best can not resist.—*Ib.*, p. 164.

384c. What is denominated appetite is a state of suffering dependent upon disease and the craving and demand for relief are beyond the power of the will.—“What Science and the Inebriate Asylums have Taught Us,” by Dr. Willard Parker, President of New York State Inebriate Asylum, p. 4.

385a. He uses no such language now.—Dr. Jewett’s “Bound, and How,” p. 3.

386a. In hundreds and thousands of cases parents having children while temperate have afterward become intemperate, and the children born during this period have become intemperate more frequently than the older children in the proportion of five to one.—Dr. Caldwell, quoted in Reid’s “Cyclopaedia,” p. 330. See also pp. 72-74, and Carpenter on “Aleoholic Liquors,” Chap. i. 36, and Story’s “Alcohol,” pp. 244-258, etc., etc.

386b. The exciting cause is the actual use of intoxicating liquors.—“Bacchus Dethroned,” p. 20.

386c. Remote causes may exist in full force, but if intoxicating liquor be abstained from Oinomania can not be induced.

No person ever suffered from Oinomania who did not, in the first place, use intoxicating liquor, and it is the so-called use of these liquors that produces this disease.—*Ib.*, pp. 20 and 21.

388a. “Bacchus Dethroned,” p. 21.

LESSON XXXII.

388a. “Timothy Titcomb’s Testimony Against Wine,” p. 3.

389a. A man called upon some Government officials with the expectation of making large contracts for goods. They immediately invited him to drink. He declined. They insisted with oaths that he must drink. Then he refused. Then said one, “You buy no goods of me,” and walked away. The next morning the fiery madness having been slept off, the officers made most unexpectedly large contracts, because they had found a man as true as steel ; a man that could be trusted.—*Ib.*

398a. Let us remember that the one invited has a right to decline. An officer of the Crown of England once sent me a glass of wine at a public dinner. I acknowledged the gift and never touched it. While explaining my course to him afterward I could see that I had risen one hundred per cent. in his estimation. If I had not seen it, he would have sunk two hundred per cent. in mine.—Rev. H. W. Warren in “Scientific Certainties,” p. 22 (348).

399a. At the dinner-table wine is no longer pertinaciously and almost vulgarly forced on every guest, as once it was ; neither is every total abstainer a marked man to be made the unhappy victim of rude jest because of his conscientious determination to live according to natural rule.—Dr. Richardson in “Action of Alcohol on Body and Mind,” p. 49.

401a. *Our Union* for July 15, 1880.

403a. Early in the month of January, when his health was in the course of improvement, Burns tarried to a late hour at a

joyful party in the Globe tavern. Before returning home, he unluckily remained for some time in the open air, and overpowered by the effects of liquor he had drank, fell asleep. . . . A fatal chill penetrated his bones; he reached home with the seeds of a rheumatic fever already in possession of a weakened frame. In this little accident (?) and not in the pressure of poverty or disrepute or wounded feelings or a broken heart, truly lay the determining cause of the sadly shortened days of our great national poet.—“Chambers’ Life of Burns,” quoted in Reid’s “Cyclopedia,” p. 188.

403b. They had drank so deep they lay out in the fields all night.—*Ib.*, p. 194.

403c. After days of dissipation and madness he died in the public hospital of Baltimore at the age of thirty-eight.—*Ib.*, p. 192.

403d. *Ib.*, pp. 188–190, and Handbill Tract, 25.

LESSON XXXIII.

405a. They (beer, wine, and spirits) can not properly be called foods. They make people dull, heavy, stupid, and unfit for work. The most severe and continued work can be performed without them, and there are now some millions of people in this country who never taste them. Happy will be the day when they are not drank by any. Then there will be less quarreling, poverty, and crime, and more food, clothing, and education.—“Health,” pp. 53, by Edward Smith, M.D., F.R.S., LL.B.

406a. Probably the wine-growers of this part of Switzerland (the Cantons of Geneva, Vaud, and Neufchâtel), consume more wine than any people in any other part of the world.—Mons. Briguët in “Centennial Temperance Volume,” p. 360.

406b. Here (in Switzerland) more intoxication was obvious than in any other place in which it was ever my lot to live. In Berne twenty-five times more brandy was used in 1868 than in 1811.—Rev. E. S. Lacy, in “Truth about Wine,” p. 3.

406c. *Ib.*, p. 7.

407a. His old appetite was aroused by a glass of domestic wine offered by a lady who pronounced it “pure juice of the

grape."—Rev. Dr. Thayer, in "The Cider Question and its Relations to the Temperance Cause," p. 5.

411a. "Cider-drinking Boys," pp. 2 and 3.

411b. *Springfield Republican*, quoted in *National Temperance Advocate*, for July, 1879.

412a. *New York Observer*, October, 1879.

413a. "The Cider Question," p. 7.

413b. If the appetite for strong drink can be created by the use of fermented cider, and we can not tell when fermentation begins, it follows that there is no safety except in the total disuse of the article. Especially is this true of the young who are in the habit of drinking "sweet cider."—*Ib.*, p. 7.

414a. A Bavarian's notion of Paradise at all times is "barrels of beer and barrels of beer, and always the same thirst."—*Western Brewer*, August 15, 1880.

416a. "Hop Lager" was claimed by the sellers to be not intoxicating, and it was allowed to be sold in some places in Maine. At last it occurred to some one that if there were no alcohol in it they would not drink it. He had it analyzed, and found that it contained four per cent. alcohol.

LESSON XXXIV.

418a. Reid's "Cyclopedia," p. 541.

419a. *Ib.*, p. 540.

420a. "Morning Dewdrops," p. 197.

423a. Reid's "Cyclopedia," p. 535.

424a. Guthrie's "Temperance Physiology," p. 276.

425a. "Morning Dewdrops," p. 204.

426a. Reid's "Cyclopedia," p. 504.

427a. *Harper's Magazine*, 1877, and Guthrie's "Temperance Physiology," p. 275.

429a. Guthrie's "Temperance Physiology," pp. 299-306.

430a. "Cantor Lectures," p. 178.

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